COMMUNITY NOISE REPORT SUMMER HILL

PRELIMINARY

2003 - 2005

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ABSTRACT

This study is part of ongoing community noise monitoring being carried out by one Summer Hill resident. The location is a residence adjacent to a select primary school in Moonbie Street , Summer Hill. Aircraft noise data have been monitored using a computer-based data logger and microphone since 2002. The paper summarises the maximum recorded sound levels (LA max) for the majority of noise events from 2002 to 29 November 2005 .

Around 50% of airport departures from Runway 34 Left are captured by the system amounting to in excess of 13,000 departures in each of 2004 and 2005. The Average maximum noise level (LA max) over four years is 78.8 dB(A) +/- 5.2 (Standard Deviation). The proportion of departures exceeding 80 dB(A) varies from 40 and 55 % of total noise events depending on the year. More than 80% of noise events were greater than 75 dB(A). The computed Australian Noise Exposure Index (**ANEI**) for 2002, 2003 and 2005 exceeded the level of 25 dB(A), a value not supposed to be reached in Summer Hill under Sydney Airport's Master Plan until well after 2023. The Energy and Time Averaged Equivalent noise levels LA_{eq} were found to be around 64 dB(A) on a whole of year basis, and over 65 on a operational period basis.

Such levels are rated as only ***"conditionally acceptable"*** for building site approval near an airport according to Australian Standard AS 2021-2000; and unsuitable for residential siting adjacent to noisy industrial sites according to the NSW EPA document "Industrial Noise Policy Guidelines" for suburban areas . The noise levels recorded are considered excessive and potentially harmful to important aspects of human health and welfare according to a World Health Organisation-commissioned report in 1995, as confirmed by later studies . The results confirm the event noise levels reported by an Airservices Australia Study (Report No. 1360) carried out in the first quarter of 2003, the aftermath of which is that nothing has been done.

The onus is now on Airservices Australia, the author of the "Long Term Operating Plan for Sydney (Kingsford Smith) Airport" - ie LTOP (aka ***"The Fair Share Noise Plan"***) to either rebutt the data by effectively monitoring noise levels in the inner west, or to take remedial action through intelligent air traffic control to properly implement the LTOP as promised. In particular it should implement the noise abatement departure protocols (ICAO-"A" -standard) as directed by the Transport Minister in 1998. .

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1. INTRODUCTION

Since 1997 the Summer Hill and Ashfield communities have borne the brunt of northerly directed takeoffs, mainly jet departures, from Sydney Airport. There have been numerous instances of the frequency of noise complaints from Summer Hill being deprecated at the Government's Sydney Airport Community Forum, commencing with early denunciations by the then Transport Minister Mark Vaile MP to the effect that the community was "rorting the complaints line" [#3] . More recently there has been consternation expressed that as allegedly as many as several hundred complaints per fortnight can emanate from as few as , sometimes only 3-4 people.

During early 2003 Airservices Australia Environment Branch carried out a monitoring study into aircraft noise at a location in Henson Street, Summer Hill (ref. ASA Report No. 1360, Sept. 2003). That study showed Boeing 747 jet aircraft noise levels averaging 80 dB(A) +/- 4 (SD) . That report also confirmed resident observations that the reason for the high noise levels is the very low flying being undertaken by jet aircraft across the subject area.

The noise levels documented by report No. 1360 provoked a strange response from the government SACF which at first questioned its validity . As that study was the very first extended noise monitoring exercise carried out in the Ashfield area (excluding NMT 15, as to which see later) , in five years of operation for the LTOP , one has to wonder why on earth such suspicion attached to the fact that , yes, the people of Summer Hill (and by inference neighbouring Ashfield) , had drawn the short straw in the LTOP lottery. The noise levels in question were more akin to those experienced by the people of Sydenham and Tempe than expected at the point in question (about 7 km from takeoff roll) , which leads to the question why?

Airservices Australia environment branch staff duly assured the government SACF that the data were reliable and sound. Yet still nothing has been done to improve matters for the people of Ashfield and Summer Hill, who were promised by John Howard prior to election in 1996 that they would receive no more aircraft noise than they received prior to the commencement of LTOP[#4] .

It is surprising that noise monitoring exercises have been regularly carried out in areas more traditionally exposed to aircraft noise (eg. Lane Cove, Kurnell) , yet areas newly-affected by noise since LTOP (such as Ashfield) have been neglected , despite the requirement of then Environment Minister Hill for monitoring to occur. Noise Monitoring data collected at NMT No. 15 (Presbyterian Ladies' College, Croydon) , when analysed scientifically , show that the main flight tracks pass predominantly to either side of the monitor , rather than directly over it [#5]. Thus one can conclude that the monitored data understates the worst features of aircraft noise for the surrounding neighbourhoods.

It is very important for those responsible to understand that for many it is not just a matter of disliking aircraft noise, but when exposed at the levels reported in Environment Branch Report No. 1360, people can actually suffer physiological harm [#6]. Far from such people being simply "nutters" , for being bold enough to complain, as disrespectfully described a year or so ago by someone on the government SACF, they are in fact being driven to distraction by the ignorant pursuit of the LTOP plan without proper environmental controls.

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3 Vaile Press Release, April 1998

4 SMH 9/2/1996

5 See separate report (in press)

6 "Community Noise", Berglund , B. & Lindvall, T. (1995) , Karolinska Institute, Sweden, Archives Centre Sensory Res. 2(1), 1-195, Figure 4, para. 7.1.2.2, Report to WHO.

This study is part of ongoing noise monitoring being carried by one such resident (JH) , in part as a community service, but also as a means of substantiating the progressive hearing loss he incurs through remaining in the home he loves and purchased pre-LTOP , when it was a quiet location. He regularly forwards faxed data containing his complaints to Airservices Australia, but hitherto reports having received no response.

His co-author (PSL) [#7], was persuaded to assist in presenting the present data in the interests of hopefully securing a more just aircraft noise outcome for the people of the inner west generally, and Summer Hill in particular , and to bring to public attention the likely health detriments resulting from continuation of present practices .

2. METHODS:

The noise monitor used in the reported data collection is an always-on device based on a Personal Computer with a commercially-available data-logging module (Picotech® [#8], DrDAQ® data acquisition unit) , as frequently in education. The DrDAQ unit records sound pressure changes in A-weighted decibels from an electret microphone at regular intervals onto a computer hard disk (< 1 second between readings , max collection rate 15000/sec). The system is sensitive to changes in sound pressure level of 1 dB(A), and as supplied is accurate to 5 dB(A). The range of sound pressure level to which the unit is sensitive is 55 - 100 dB(A). The frequency bandwidth of the microphone would be typical for an electret, ie. nominally 50 - 15000 Hz Also monitored is temperature, and sound frequency. The computer clock is synchronised 3 - 4 times per week with the CSIRO atomic clock. A typical output trace from the recording system is shown as Table 1 in Appendix "A".

The microphone is located outside , in the open, at a height of 930mm above a grass surface using a shielded extension cable (Soundlink type SHW-1207) . The unit is built into a weather-proof PVC housing, with a foam plug to prevent water penetration and wind effects. It is situated behind a residence in Summer Hill , which is across the road from a State Primary School . At most times the machine is attended, and auditory confirmation of the fact of an aircraft noise event is possible. However, such detailed attention is not mandatory . Although the residence is near to a main road (The Old Canterbury Road) and a residential feeder (Junction Road), the area is federation period , double brick bungalow-style residential, which is generally held to be a quiet residential area.

From the noise record it is possible to manually scrutinise the record to determine whether the recorded sound profile is in fact consistent with that of an aircraft - from its recorded frequency spectrum and the time course of its amplitude characteristic . It is a relatively simple matter , by inspection , to eliminate extraneous noise events such as motor vehicles, whistles and the like . At the end of each day , or at some later time convenient, the maximum recorded sound level (LA max) is noted down against the time of the recording, and a day-file for each series of events created.

The noise monitor can only operate when the subject family is in residence. Therefore there are periods ranging from 9 (2004) to 92 (2002) days each year when data are unavailable (See Table 5).

Calibration:

The noise monitor is subjected at least once daily to random calibration tones at 1000 Hz using an industrial noise calibrator (Testo® model IEC 942/90 Class 2 ; Farnell Order code 892-889) with an

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[8] www.picotech.com; www.drdaq.com; See "Silicon Chip" article July 2000, Peter Smith

instructions for calibration, when the sound pressure level read by the datalogger can be adjusted if necessary (See trace).

A typical day trace showing the manually -extracted LA max [#9] levels is reproduced in Table 2 of Appendix "A".

Monitoring occurs continuously throughout the year, excepting for periods when the monitor owner's family takes annual vacation. Thus typical annual data records since the beginning of 2003 contain about 11 months monitoring (See Table 5).

Data Verification:
To authenticate that the noise being recorded is actually from aircraft overhead, the frequencies of data collection for each day of recording have been compared with ***Sydney Airport Community Forum's*** regular fortnightly ***"Sydney Airport Briefing Notes"*** published on their website . It is recognised that it may be desirable to confirm the times of the alleged overflights against those for all aircraft departing northwest, and these data have been requested by the Department of Transport from Airservices Australia on behalf of one of us (PSL) .

Percentage agreement of monitored noise events with officially-reported daily north-west departures from Runway 34L are listed in Table 4.

Data Analysis
The LA max values in A-weighted decibels are tabulated in chronological order according to the format used by the Department of Transport's "TNIP" software for N70 analysis [#10], and processed in spreadsheet format to produce mean, standard deviation, ***Australian Noise Exposure Index*** (ANEI) and the ***Equivalent Energy-Averaged Noise Exposure*** for each year (LA eq).

The methods for achieving this are described in Appendix "K" to ***"The Way Forward for Aircraft Noise Sharing at Sydney (Kingsford-Smith) Airport"*** [#11] , and generally follow standard acoustical practice. The formula for ANEI employed is the one published in Australia Standard AS2021 -2000, "Acoustics - Aircraft noise intrusion- Building siting and construction" , p. 45 for the Australian Noise Exposure Forecast (ANEF).

For a single location subject to noise impacts from a variety of flight paths all of which pass more or less directly overhead, the ANEF formula [used here to obtain ANEI] , can be reduced to :

$$\text{ANEI} = 10 \log_{10} \sum_{t}^{N} 10^{\{\underline{\text{ANEI}}_i/10\}} , \qquad \text{.....1.}$$

where i is the i'th event and :

$$\underline{\text{ANEI}}_i = \text{EPNdB}_i + 10 \log_{10} [N_d + 4 N_n] - 88 \qquad \text{.....2.}$$

where N_d and N_n are the number of events observed during "day" and "night" , respectively, and

$EPNdB_i$ is the "effective perceived noise level in decibels" .

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9 LA max = maximum sound level in dB(A)

10 Microsoft, csv format , NMT,DATE,TIME,AC_TYPE,OPERATION,LAMAX

11 P.S. Lingard et al ., SACF Inc , PO Box 104 Summer Hill, NSW 2130, 2003; ISBN 0-9751843-4-2 (pbk); 0-9751843-5-0 (pdf)

$EPNdB_i$ is the "effective perceived noise level in decibels" .

For all intents and purposes EPNdB may be obtained from the maximum event noise in A-weighted decibels (LA max) by adding a constant which is around 13 [#12] , ie:

$$EPNdB_i \text{ [in dB(A)]} = LA\ max_i \text{ [in dB(A)]} + 13 \qquad .....3.$$

The ANEI is thus computed for the entire period of recorded events, and the summation in equation (1) averaged for a single "representative" day.

Thus, for monitoring representing whole year (365 days) the summation would be divided by 365. For a lesser period, the lesser number of days would be employed.

The Australian Standard (AS2021) now provides that for Defence Department airports , where aircraft activity typically occurs in bursts of a few days or during weekdays only, then averaging will be carried out for the lesser time than a whole year (AS2021 para A2.4) . This results in a larger effective ANEI (or ANEF) for the reduced period, than if it were to be calculated for a year. It is considered to better reflect the degree of community annoyance than the annually averaged data used for civilian airports.

Although this method is expressed in AS 2021 to apply to Defence Department airports, where usage is subject to the on and off requirements of exercise periods, we submit that it is also contestably applicable to residential areas of Sydney, not on established ***"Flight Tracks"*** , which are subject to variable , but heavy activity. Both methods (whole year and "reduced year") are therefore compared in the results shown here.

3. RESULTS:

Full data files are attached to the electronic copy of this report , and are obtainable on disc upon request from the authors. These files provide the full raw LA max data from which the results have been calculated (See files 200xnois.txt, where x is the number of the year).

3.1 Average Noise in A-weighted Decibels :

Table 1 provides the average noise with standard deviations for each of the years for which data are available.

TABLE 1 Maximum Average Event noise (LA max) in dB(A)

YEAR	Ave LAmax dB(A)	SD	Min LA max	Max La max	Number of event data	Number of recorded days[#]
2002 [*]	80.36	6.15	52	101.4	9,670	158[*]
2003 (~ 11 m)	79.75	4.92	57.8	100.7	11,441	221
2004 (~ 11 m)	79.06	4.64	61.9	97.8	14,081	251
2005(10 m to 29/11)[*]	79.99	5.16	57.6	97.8	13,268	215[*]
* Part year record # as recorded						

[12] See NAL Report 88 , *"Aircraft noise in Australia: A survey of community reaction"* , February 1982, National Acoustics Laboratories, Australia, Table 8.1 , p. 128.

3.2 Numbers of Departures Exceeding Given Noise Thresholds:

Table 2 provides the percentage noise levels for each year falling into each of 7 decibel (dB(A))threshold categories. The table also shows the number of flights per "noise-affected day" for the subject site in each year .

TABLE 2 Numbers , Percentage and Number /day of Events greater than given dB(A) level

YEAR	>60	>65	>70	>75	>80	>85	>90 dB(A)
2002 Total	9,638	9,536	9,246	7,871	5,329	1,962	526
Percent 02 >	**99.67%**	**98.61%**	**95.62%**	**81.4%**	**55.11%**	**20.29%**	**5.44%**
No. per day-02	61	60.35	58.52	49.82	33.73	12.42	3.33
2003 Total	11,438	11,425	11,300	9,478	5,418	1,432	339
Percent 03>	**99.97%**	**99.86**%	**98.77**%	**82.84**%	**47.36**%	**12.52**%	**2.96**%
No per day-03	51.76	51.7	51.13	42.89	24.52	6.48	1.53
2004 Total	14,081	14,051	13,874	11,276	5,704	1,426	75
Percent 04 >	**100%**	**99.79%**	**98.53%**	**80.08%**	**40.51%**	**10.13%**	**0.53%**
No. per day-04	56.1	55.98	55.27	44.92	22.73	5.68	0.34
2005 Total	13,266	13,258	13,034	10,922	6,517	2,254	392
Percent 05 >	**99.98**%	**99.92**%	**98.24**%	**82.32**%	**49.12**%	**16.99**%	**2.95**%
No. per day-05	61.7	61.67	60.62	50.8	30.31	10.48	1.82

3.3 Australian Noise Exposure Index & LA eq:

Table 3 lists the calculated Australian Noise Exposure Index levels (ANEI) and the Equivalent Energy Averaged Noise Exposure , LA eq (dB(A) , calculated for each partial annual period , first assuming the data represents a full year record, and second for a period limited by the recorded number of days.

TABLE 3 Calculated ANEI and LA_{eq} for stated conditions

YEAR [days]	**ANEI (365days)**	**ANEI (record days)**	**LA eq (365 days)**	**LA eq (record days)**
2002 [158]	25.21	28.84	64.16	67.79
2003 [221]	25.06	27.24	63.3	65.53
2004 [251]	24.28	25.9	62.96	64.59
2005 [215]	25.37	27.67	64.12	66.42

3.4 Data Verification:

Table 4 shows the data verification process as carried out by comparison with the ***"Sydney Airport Briefing Notes"*** data for numbers of northwest departures per day from runway 34 Left.

TABLE 4 Data Verification by Month showing Percent of Detected Flyovers

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2002	29%	26%	NA	5%	NA	NA	63%	61%	60%	70%	63%	71%	50%
2003	50%	NA	52%	48%	46%	46%	45%	51%	47%	42%	49%	34%	43%
2004	43%	40%	47%	51%	53%	51%	48%	50%	48%	37%	44%	39%	46%
2005	57%	51%	56%	57%	54%	56%	56%	51%	52%	NA	NA	NA	54%

The Table shows the monthly percentage flyovers recorded by the subject monitor compared to the number published for the period in the SACF ***"Briefing Notes"*** .

Table 5 (below) lists the numbers of days and aircraft involved in what Airservices Australia might claim *false positive* noise event "catches" were recorded by the monitor. However, as the ***Briefing Note*** data may not always be reliable [#13] , more detailed verification cannot be undertaken without official confirmation of raw departure time data for the periods in question. Airservices Australia should also assist by conducting more extended professional noise monitoring across the northwest.

TABLE 5 Apparent "False Positive" Events Statistics:

YEAR	FALSE POSITIVE DAYS (Total days)	"FALSE-POSITIVE" FLIGHT NUMBERS VS. (TOTAL OPS) & as %	NON-OPERATIONAL DAYS (commissioning or vacation related)
2002[#1]	18 (158)	1085 (9670) = 11.2%	92
2003	9 (221)	506 (11441) = 4.4%	49
2004	7 (251)	37 (14081) = 0.26%	9
2005	4 (215)	12 (13268) = 0.09%	43

[1] Monitoring Equipment was being commissioned during 2002

4. DISCUSSION OF RESULTS:

A very large amount of data were recorded in each year, varying from 9670 overflights in 2002 to 14,081 in 2004. Due to flight path spreading over the inner north west , the fact that on average around 50% of reported takeoff events have been captured shows that there is a high probability of the data corresponding in fact to aircraft noise. However, due to the fact that data could only be collected for typically 11 months in each year, the energy and time averaged values calculated may underestimate the true maximum level.

4.1 Maximum Sound Level in dB(A) (LA max)

Average LA max data in dB(A) were listed in Table 1 and the percentages exceeding given decibel thresholds are shown in Table 2.

[13] For example see 2nd fortnight in October 2003 which lists data for July 2002!

Table 1 shows that the average LA max values for each monitored period are in the vicinity of 80 dB(A), with standard deviations varying between 4.6 and 6.1 . The ranges of variation observed (62 - 98 and 52 - 101 dB(A), respectively) are consistent with these standard deviations . What is notable are the very high average values of the data. 80 dB(A) is 10 decibels above the level which power tools are permitted to make under State regulations . It represents a 10-fold increase of intensity above 70 dB(A) and approximately a three-fold increase in sound pressure level. It is approximately ten times the level (63 dB(A)) which would just permit intelligible speech communication between persons standing what might be considered a "decent distance" of around 500 mm apart.

There is nothing new in the fact that this report reveals such high figures, because the similar average levels occurred for B747 class jet aircraft in the Airservices Australia Environment Branch report No. 1360 of July 2003. The latter reported a 93 day monitoring exercise at a location around 0.5 km from the present location on Henson Street, Summer Hill. It showed that B747 class jets were flying in a configuration such that the ground noise level was 80 +/- 4 (SD) dB(A) at that location.

The present data thus confirm and extend the data found by Airservices Australia and indicate that unacceptable levels occur all year long. Even more disturbing , however, is that around 50% of all measured events are over 80dB(A) , being 55%, 47% , 41% and 49% for the available data in 2002 - 2005, respectively . More than 80% of noise events were greater than 75 dB(A).

Thus the noise level for each event significantly exceeds the level of 50 dB(A) recommended by AS2021 for sleeping areas in houses, home units and flats [#14] , namely by "on average " 30 dB(A)!

For the case of *"other habitable areas"* , where people might be expected to be talking to each other, speaking on the phone to conduct business, or perhaps watching television or listening to parliament on the radio, the recommended level is 55 dB(A), a massive 25 dB(A) below the average for the aircraft noise events in this residential area. The average standard of construction in the area is sturdy, ie double brick.

But even with such insulation levels, at best 20 dB(A) can expected to be sheared off the outside noise level with all the windows and doors fast shut [ie inside level to 60 dB(A)]. With windows open (the normal case for summers in Sydney) , the indoor level would be 70 dB(A) or more. This is not enough to satisfy the requirements of Australian Standard (AS2021).

Both the LTOP Reports[#15] proposing the "noise share plan" and the more recent Department of Transport document *"Expanding Ways to Describe and Assess Aircraft Noise"* [#16] , emphasise the desirability of maintaining external aircraft noise at ground level to 70 dB(A) because this is ostensibly the level at which normal home insulation will reduce the external noise to *"the indoor design sound level"* , which the latter document alleges is 60 dB(A), with doors and windows still open.

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14 AS2021 Table 3.3

15 "The Long Term Operating Plan for Sydney (Kingsford-Smith) Airport, Airservices Australia & SACF, Dec. 1996.

16 D. Southgate et al ., March 2000

The actual values recommended in AS2021 -2000 for houses, home units and flats are listed in Table 6, below:

TABLE 6: AS 2021-2000 Indoor Design Levels

INDOOR DESIGN SOUND LEVELS -Houses, home units, flats [#1]	Level dB(A)
Sleeping areas, dedicated lounges	50
Other habitable spaces	55
Bathrooms, toilets, laundries	60
DOTRS Government Designated maxima [#2]	60

[1] AS 2021-2000 Table 3.3

[2] Southgate et al , Expanding Ways to Describe and Assess Aircraft Noise, March 2000

As made clear elsewhere[#17] , the "N70" parameter , promoted in the latter document by the Department , is a minimum contour level, and within a given N70 contour, a very high fraction of noise events can greatly exceed that level.

This is eminently illustrated by Table 2 (tthis report) where 95% of values are included at the N70 level, but nevertheless around 50% of values are also found to be 80 dB(A) or greater.

What must be asked is why nothing has been done by Airservices Australia to address this problem, given the tabling of Environment Branch Report No. 1360 late in 2003. The subject location is in the vicinity of 7 km from the most distant takeoff roll position on runway 34 Left. Why then is the distribution of noise levels at this position more like those to be expected in the vicinity of a location only 1-2 km from takeoff roll , eg. Sydenham?

4.2 AS2021 Standard for "Light General Aviation Airports"

Table 2 also lists , for each decibel grouping , the number of flights per day involved at the given threshold dB(A) . For example , in 2005 to 29 November (there have been an average of 51 departures per operational day exceeding 75 dB(A). Table D1 in AS2021-2000 of the section dealing with building site acceptability for *"light general aviation aerodromes"* , where there is no ANEF chart [#18] , states that more than 20 flights per day of 75 dB(A) or greater is only *"conditionally acceptable"*, and that the same number at the level of 85dB(A) would be considered *"unacceptable*," for a building site without aircraft noise insulation.

Whilst being deliberately contentious in applying this general aviation standard to an area around Sydney Airport, the intermittent nature of flight track usage might suggest otherwise, and there was no ANEF for the LTOP at Sydney Airport until March 2004, the message should be clear! Surely what is good enough for people around a light GA airport should be good enough for the citizens of Sydney?

4.3 Calculated ANEI for the Summer Hill Residential Location

The ANEI parameter , or the "Australian Noise Exposure Index" is employed for monitoring progress towards the achievement of forecast noise impact *"targets"* predicted by the "Australian Noise Exposure

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[17] "The Way Forward for Aircraft Noise Sharing at Sydney (Kingsford Smith) Airport" , SACF Inc , 2003, ISBN 0-9751843-4-2 (pbk); 0-9751843-5-0 (pdf) .

[18] Sydney did not have one for 5 years from the implementation of LTOP in 1997!

Forecast" (ANEF) for an airport. One method is to compute data using the Integrated Noise (computer) Model (INM) as developed by the US FAA. This model starts with the assumed flight track data for each aircraft . This in turn presumes that Airservices Australia knows exactly where each aircraft is in three dimensions at all points on its path , and especially its local altitude .

A consultant report (Ambidji) to Airservices Australia during the PRM trial[#19] in 2001 showed that Airservices Australia did not then know , to within better than 0.5 - 1 km , where aircraft under its control were headed. This was a particular problem if the flight path was curvilinear. The Ambidji findings confirmed the oft-experienced consternation of residents who , upon requesting the flight track for a low-flying aircraft seen flying right over their roof at the stated time, received a track asserting that it was actually several blocks away! Naturally the responsible officer, if challenged always claimed that it was the resident who was hallucinating, not the other way round!

A better method of calculating ANEI is to actually measure the noise of the aircraft at ground level. This, after all , is what people experience from day to day and involves no assumptions. This was (hopefully) the method used by Airservices Environment Branch to estimate the ANEI at the Henson Street location in Report No. 1360.

Table 3 , above, lists the ANEI values for the subject location calculated from the measured maximum noise event levels (LA max) for each monitoring year . Both calendar year averaging and operational day bases have been employed .

The ANEI for each monitored year was calculated using the process described in Equations 1 to 3, above. The ANEI values (assuming a 365 day year) appear to be around 25 dB(A).

Referring to AS2021 for guidance (See Table 7, below), as to whether the aircraft noise at a notional "building site" at this location is satisfactory , one finds that 25 ANEF represents a site which is only ***"conditionally acceptable"*** for a house, home unit or flat[#20] . This finding must be viewed in light of the Sydney Airport Master Plan noise level forecasts , which showed that the 25 ANEF contour was not supposed to reach closer to Summer Hill than Lewisham by year 2023!

TABLE 7 BUILDING SITE ACCEPTABILITY ACCORDING TO AS2021-2000

BUILDING TYPE /ANEF-ANEI	ACCEPTABLE	CONDITIONAL	UNACCEPTABLE
House, home unit or flat	< 20 ANEF	20-25 ANEF	> 25 ANEF
School, University	< 20 ANEF	20-25 ANEF	>25 ANEF
Hospital , Nursing Home	< 20 ANEF	20-25 ANEF	> 25 ANEF
Hotel, motel, hostel	< 25 ANEF	25-30 ANEF	> 30 ANEF
Public Building	< 20 ANEF	20-30 ANEF	> 30 ANEF

Naturally, representing the ANEI in terms of the actual number of days of affectation (we submit - the more honest Defence Department way - see AS2021, para. A2.4) , the ANEI approach 27-28 dB(A) [#21] .

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19 "Sydney PRM Trial Aviation Report", The Ambidji Group Pty Ltd , April 2001

20 The range of options is "acceptable" , "unacceptable" or "conditionally acceptable".

21 The value reported for the Airservices tested site in 2003 (EB Report No. 1360) was ANEI = 17dB(A), which was stated to be "acceptable" for the residential useas being reported as being less than 20.

Were they to reach the level of ANEI = 30 dB(A), then the home might qualify for Commonwealth subsidised noise insulation, but not otherwise. This is despite the fact that both the Commonwealth Environment Department and the NSW EPA, would recommend noise insulation (or cessation of the noise) at lower values of ANEI.

Also bear in mind that just across the road, is a select State primary school, where children's classes are reported to suffer from interruption at frequent intervals.

The above ANEI are greater than those reported as having been computed for the official Summer Hill study of early 2003 (Report No. 1360) which gave an ANEI = 16.7 over 93 days . The first fifteen days of the period (13/2/2003 - 17/5/2003) monitored by Airservices Australia are missing from this study. However the ANEI computed from our data for the 78 remaining days of the same period is 23.04 dB(A). The reason for the different ANEI is unclear as the average maximum sound levels (79 dB(A)) are similar, otherwise the difference might be explained by the ca. 0.5 km separation of the two locations . Perhaps coincidentally, however, if Airservices data had been mistakenly computed assuming a full year's data was available (ie 365 instead of 93 days), then our ANEI estimate (16.3) lines up with theirs (16.7), but the mathematics would then not make sense.

4.4 Energy Averaged Equivalent Noise Level , LA eq

Table 3 also lists the calculated LA eq for (a) a full year and (b) the recorded operational days. The calculated values are between (a) 60 and (b) 65. For perspective, these data should be considered in the light of New South Wales Government , EPA- prescribed noise guidelines for Suburban areas near industrial sites [#22]. These guidelines (See Table 8 , below) recommend that an industrial activity should not be permitted at a site adjacent or within earshot of a suburban residential area if the LA eq levels exceed the following:

TABLE 8 NSW INDUSTRIAL NOISE GUIDELINES:

NSW EPA Table 2.1	ACCEPTABLE	MAXIMUM
DAY	55	60
EVENING	45	50
NIGHT	40	45

Clearly what is happening from aircraft activity at the subject site produces annually averaged energy average noise levels which would exceed these guidelines, if the aircraft flying overhead were operating in a defined industrial site. If the practice of flying aircraft overhead is not an *"industrial"* type of activity , which should be subject to the above restrictions, then perhaps official consideration should be given to making it so.

4.5 Data Verification:

Table 4 compares the number of recorded noise events with the total runway 34 Left departure numbers reported in the SACF bimonthly ***"Sydney Airport Briefing Notes"*** . This is to avoid the allegation that extraneous noise has been included. If extraneous data were included , the recorded data would be expected to exceed the official number of aircraft departing from Runway 34 Left.

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[22] New South Wales Industrial Noise Policy, ISBN 0 7313 2715 2, January 2000, Table 2.1 Amenity Criteria.

To support our contention that the recorded data is most probably aircraft related, the departure numbers were compared day-by-day and month-by-month for the entire period of the instant recordings. The summary in Table 4 shows that in all cases the total numbers of events per month are significantly fewer than the total officially notified departures from Runway 34L.

The annual average of bimonthly data records in the last column show that between 43 and 54% of operations are being "captured" by the noise monitor at the subject location. This is not an excessive proportion, as any observer on a busy day could attest. Whilst there is some track spreading , as recommended in the LTOP Reports [#23], there is definitely a local concentration of flight tracks crossing the subject property . This must be investigated and eliminated . There is also the question why the subject aircraft , this far from take-off roll, are flying so low , as low flying is the only explanation for the very high noise levels being produced [as to which see later -***Suggestions for Improved Operations***] .

Table 5 breaks down the statistics to show that in fact there are some apparently "false-positive" recordings, where it appears from the SACF ***Briefing Notes*** no aircraft flew over Summer Hill, yet were recorded by the monitor . It has also been observed that in some wind conditions, aircraft flying close to the subject property will not be detected by the microphone. Thus while there are some false-positives there are also missing values, and recalling that the station does not monitor for any full year, the overall impact is in the later years quite small, and unlikely to be exaggerated.

As mentioned earlier, one explanation for "false-positives" in Table 5 is that in a certain obvious instance the Airservices operative preparing the Briefings notes duplicated the July 2002 data set for the October 9 to 22 2003 bimonthly report. This situation only became apparent because the October 2003 report actually lists the table as being for July 2002! The possiblility of other spreadsheet "copy-overs" which have escaped detection in the SACF ***Briefing Notes*** is therefore real .

Recalling again the import of the Ambidji Report, that for at least the early history of LTOP up to and including the early PRM trial , Airservices could not pinpoint where its aircraft were to better than 500 -1000 metres [#24] . If such errors occur in lateral positioning accuracy, what confidence can there be in Airservices knowledge of aircraft altitude along a flight path, which is what most directly determines the noise level on the ground?

It is submitted that the verification process carried out by the authors suffices to establish that there is a significant case to answer for Airservices Australia in terms of addressing the cause of aircraft noise concentration in this sector of Summer Hill.

Fuller verification of the instant data therefore awaits the provision by Airservices Australia Environment Branch of historic records of departure times for the entire four year peirod of this report. At the time of writing, this data has been requested from former ***"Community Advocate"***, David Southgate, of DOTRA, but its release has been referred to Airservices Environment Branch for approval.

4.6 Suggestions for Improved Operations over the Northwest

The following reasons are posited for the excessive concentration of aircraft noise in Summer Hill:

(a) Simultaneous Overflying of Departures by Arrivals -The Departure Ceiling:
One problem with present operations is that LTOP has never been fully implemented. It appears to have been executed by people who are not fully committed to the process. Despite the revolutionary concept

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[23] The Long Term Operating Plan for Sydney (Kingsford Smith) Airport , Dec 1996, Airservices Australia, DOT

[24] Ambidji report, ibid, April 2001

behind noise sharing, the minimum possible practical accommodation has been made to ensure that noise over newly affected areas is also minimised. The formerly existing arrival routes crossing Sydney Airport must be adjusted to create adequate airspace overhead to enable northwesterly takeoffs to reach sufficient altitude quickly after take-off roll so as to minimise noise.

Such an adjustment was an essential part of both the LTOP Reports, and the Proponent's Statement . These documents clearly project that in northerly winds there would be widely spread offshore jet arrival routes , both up and down the coast , which would clear the airspace over both inner and outer west, thereby eliminating overflying of departing jets by arrivals over the Inner West, and predominantly Summer Hill. This would allow aircraft to reach greater heights while decreasing ground noise levels for the inner west.

The overflight problem is amply illustrated from the Environment Branch report No. 1360, referred to earlier , in Appendix Figures 7 and 10. These are reproduced herewith as Appendix "B". Figure 7 shows all jet arrivals onto 34 Left for the period from 14/10/2002 - 14/4/2003, while Figure 10 shows all jet departures from 34 Left in the same period.

What is evident from the figures is the effective *altitude ceiling* created by the arrivals overflying the simultaneously departing jets . The ceiling is roughly 6000 feet, while the departing jets are constrained to fly below the separation requirement (1000 ft below) , ie under at most 5000ft (See upper right hand panel on both figures).

In order to be absolutely certain of minimising collision risk , departing plots will prefer to reduce their altitude even more to maximise separation. This explains why , at Summer Hill, departing jets conduct extremely slow climbs at altitudes of between 1500 and 2500 ft. It is therefore not surprising that they make so much noise .

For this reason it is concluded that jet departures over Ashfield, and for a much greater distances further out , must fly so obscenely low. Given clear skies ahead, pilots would naturally attempt to gain altitude fast in order to minimise fuel consumption for the trip. Incidentally this is also why low departure flying occurs as far out as Parramatta and Winston Hills[#25] .

In contrast, the Figure on page 62 of the LTOP Report for Mode 9 operations shows what should occur , had the LTOP been implemented by the book.

Instead of crossing over the inner west, the arrivals should now be proceeding out to the east from across the upper northwest beyond the northern outskirts of Sydney, then offshore down the coast. Only in this way can low-altitude cross-overs be avoided in the inner west and beyond .

Instead of departing jets from runway 34 Left still flying at 3-4000 feet all the way to Parramatta and "The Hills", both the LTOP Reports and the Proponent Statement predicted altitudes (for B747's) of 6500 ft at Wetherill Park and Baulkham Hills in the west and northwest; and that B767's would be at 6000 ft upon reaching Gladesville!

Why doesn't Airservices Australia properly implement these promised and essential environmentally significant aspects of the LTOP?

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[25] Personal Communication by Telco - Ian McLeod (ASA Environment Branch) to Philip Lingard Nov. 2003

(b) Failure to Implement ***"ICAO-A"*** (or Equivalent) Protocols over the North West:
The original LTOP plan foreshadowed the introduction of ICAO-A -style Noise Abatement Departure Protocols where appropriate. In due course and, after consultation with SACF, this was duly mandated for all takeoffs over residential areas by Transport Minister Vaile in August 1998[#26].

ICAO-A required initial steepest possible climbs to not less than 1500 feet prior to adjusting engine thrust and turning onto course direction. It has since been replaced in ICAO by a new Noise Abatement Departure protocol called ICAO-2, but the principles remain the same. Indeed some overseas airports employ much more prolonged initial climbouts in order to gain altitude so as to minimise noise over residential areas. And the principle is actually enshrined in the Airservices own ***Noise Abatement Procedures*** (NAPs) in DAP -East[#27] , but the standard instrument departure (SID) instructions for Sydney Airport (north) contradict the NAPs , and breach the Minister's August 1998 ICAO -"A" direction. Airservices Australia should be asked why did it never implement Minister Vaile's direction?

(c) More Effective Aerial Dispersion after Takeoff:
This should be self-evident, but there seems to be very little ability in the Airservices establishment to respond innovatively to the requirement. When LTOP was introduced the government mandated that existing flight corridors would be abolished, and concentrations of movements across particular areas should be avoided so that noise could not only be minimised, but also "fairly-shared."

Concentrating nearly 50% of departures at low altitude over a single residential quarter of Summer Hill or elsewhere is not "fair sharing". Given implementation of proper Noise Abatement Departure Protocols, providing sufficient altitude for departing aircraft to manoeuvre would facilitate computer-directed sequential bearing trajectories to be implemented enabling much wider dispersion of aircraft flight paths than at present.

5. CONCLUSIONS

1. This report was written to emphasis the fact that despite the historically derisory official response to noise complaints from the inner west , and particularly Summer Hill, there is in fact significant substance behind the noise complaints.

2. What is happening is the seeming focussed concentration of around 50% of all low-flying jet departures across one small street intersection in Summer Hill. The resulting noise impacts on that formerly quiet residential location and a primary school amounting to an average maximum sound level of 80 dB(A) +/- 4-6 (SD) is manifestly horrendous , and something must be done about it now.

3. The same situation was reported 30 months ago by Airservices Environment Branch (Report 1360) for a location not far removed from the subject site, yet nothing has been done to alleviate the problem, nor apparently any investigation carried out.

4. Both the Australian Noise Exposure Index (ANEI) - range 25 to 28 ; and Time and Energy Averaged Equivalent Sound Pressure Level (LA eq) - range 63 to 68 , are in the only ***"conditionally acceptable"*** region for houses, home units and flats by the criteria of Australian Standard AS2021-2000 and are unacceptable for locations near industrial sites according to NSW Government Industrial Noise Guidelines, respectively. Both are likely to cause lasting and

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[26] Press Release T159/98, 28/8/1998
[27] Airservices Departure and Arrival Procedures-East

foreseeable harm to individuals continually exposed whether directly or at the initially subliminal level.

5. A proportion of noise events exceeding 80 DB(A) of close to 50% is manifestly unacceptable and breaches Airservices own environment guidelines for all areas but those very close to runway threshold immediately following takeoff. More than 80% of noise events were greater than 75 dB(A).

6. The number of noise events per day greater than 75 dB(A) satisfies the requirement of AS2021 -2000 for light general aviation aerodromes without ANEF for only *"conditional acceptability"* for building construction. This means that new homes in such an area would require some noise insulation, whilst existing homes continue without.

7. Nearly all noise events at this location produce conditions in adjacent homes which would be likely to prevent conversation (ie > 63 dB(A)) around twice per hour on an annual averaged basis. During actual operational days the peak impact is between 3-4 times per hour on average, and can be much higher at particular times of day.

8. For those with normal hearing and sensitivity, such noise levels can be distressing , but for anyone with certain auditory abnormalities it can be both painful and physically harmful. It is a public environmental health issue that needs urgent addressing because the issue is wider than hearing defects and includes learning disorders for children, and has pyschological and cardiovascular implications for all [#28] .

9. Why since the tabling of Airservices Australia, Environment Branch Report No. 1360 late in 2003, has nothing been done to address this problem?

10. It is submitted that there is a significant case to answer for Airservices Australia in terms of need to address the cause of aircraft noise concentration and the frequency of high noise levels in this sector of Summer Hill. The onus is now on Airservices Australia, the author of the "Long Term Operating Plan for Sydney (Kingsford Smith) Airport" - ie LTOP (aka ***"The Fair Share Noise Plan"***) to either rebutt the data by effectively monitoring noise levels in the inner west, or to take remedial action through intelligent air traffic control to properly implement the LTOP as promised. In particular it should implement the noise abatement departure protocols (ICAO-"A" -standard) as directed by the Transport Minister in 1998.

11. Finally the data collection work described herein has been accomplished by one hard-working citizen trying to protect both his own and his neighbours rights to quiet enjoyment. The onus is on Airservices Australia to either rebutt the findings , or find an effective noise minimisation solution for the evident problem - no buts! The promise of John Howard in his pre-election statements prior to the introduction of LTOP that no would one would receive more aircraft noise than they had before should be honoured by those charged with implementation of the plan.

EXPLANATORY NOTE:
The instrumentation and data collection work for this paper was carried out by Johann Heinrich. The data processing and written organisation were the responsibility of Philip Lingard.

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[28] See WHO report, Berglund et al. ibid

APPENDIX "A"

Table 1 - Typical partial output trace from the recording system

Date m/dd/yy	Time	Sound dBA	Frequency Hz	Int Temp ℃	Light Level	Ext Temp ℃	
8/12/02	07:29:58	55.0	150	19.0	0.8	18.4	
8/12/02	07:29:59	55.0	86	19.0	0.8	18.4	
8/12/02	07:30:00	55.0	86	19.0	0.8	18.4	
8/12/02	07:30:01	55.0	155	19.0	0.8	18.4	
8/12/02	07:30:02	62.0	155	19.0	0.8	18.4	
8/12/02	07:30:03	62.0	83	19.0	0.8	18.4	
8/12/02	07:30:04	63.0	83	19.0	0.8	18.4	
8/12/02	07:30:05	63.0	243	19.0	0.8	18.4	
8/12/02	07:30:06	62.0	243	19.0	0.8	18.4	
8/12/02	07:30:07	62.0	255	19.0	0.8	18.4	
8/12/02	07:30:08	62.0	255	19.0	0.8	18.4	
8/12/02	07:30:09	62.0	284	19.0	0.8	18.4	
8/12/02	07:30:10	64.5	284	19.0	0.8	18.4	
8/12/02	07:30:11	64.5	163	19.0	0.8	18.4	
8/12/02	07:30:12	67.0	163	19.0	0.8	18.4	
8/12/02	07:30:13	67.0	109	19.0	0.8	18.4	
8/12/02	07:30:14	75.0	109	19.0	0.8	18.4	
8/12/02	07:30:15	75.0	230	19.0	0.8	18.4	
8/12/02	07:30:16	76.6	230	19.0	0.8	18.4	
8/12/02	07:30:17	76.6	265	19.0	0.8	18.4	
8/12/02	07:30:18	79.8	265	19.0	0.8	18.4	
8/12/02	07:30:19	79.8	302	19.0	0.8	18.4	
8/12/02	**07:30:20**	**89.0**	**302**	**19.0**	**0.8**	**18.4**	**LA max**
8/12/02	**07:30:21**	**89.0**	**276**	**19.0**	**0.8**	**18.4**	**LA max**
8/12/02	07:30:22	86.3	276	19.0	0.8	18.4	
8/12/02	07:30:23	86.3	311	19.0	0.8	18.4	
8/12/02	07:30:24	85.0	311	19.0	0.8	18.4	
8/12/02	07:30:25	85.0	209	19.0	0.8	18.4	
8/12/02	07:30:26	88.0	209	19.0	0.8	18.4	
8/12/02	07:30:27	88.0	168	19.0	0.8	18.4	
8/12/02	07:30:28	76.6	168	19.0	0.8	18.4	
8/12/02	07:30:29	76.6	263	19.0	0.8	18.4	
8/12/02	07:30:30	81.0	263	19.0	0.8	18.4	
8/12/02	07:30:31	81.0	184	19.0	0.8	18.4	
8/12/02	07:30:32	83.9	184	19.0	0.8	18.4	
8/12/02	07:30:33	83.9	157	19.0	0.8	18.4	
8/12/02	07:30:34	78.7	157	19.0	0.8	18.4	
8/12/02	07:30:35	78.7	51	19.0	0.8	18.4	
8/12/02	07:30:36	79.2	51	19.0	0.8	18.4	
8/12/02	07:30:37	79.2	75	19.0	0.8	18.4	
8/12/02	07:30:38	74.7	75	19.0	0.8	18.4	
8/12/02	07:30:39	74.7	107	19.0	0.8	18.4	
8/12/02	07:30:40	74.1	107	19.0	0.8	18.4	
8/12/02	07:30:41	74.1	70	19.0	0.8	18.4	
8/12/02	07:30:42	73.2	70	19.0	0.8	18.4	
8/12/02	07:30:43	73.2	112	19.0	0.8	18.4	
8/12/02	07:30:44	64.9	112	19.0	0.8	18.4	
8/12/02	07:30:45	64.9	67	19.0	0.8	18.4	
8/12/02	07:30:46	71.2	67	19.0	0.8	18.4	
8/12/02	07:30:47	71.2	86	19.0	0.8	18.4	
8/12/02	07:30:48	73.3	86	19.0	0.8	18.4	
8/12/02	07:30:49	73.3	58	19.0	0.8	18.4	
8/12/02	07:30:50	69.5	58	19.0	0.8	18.4	
8/12/02	07:30:51	69.5	62	19.0	0.8	18.4	
8/12/02	07:30:52	66.9	62	19.0	0.8	18.4	
8/12/02	07:30:53	66.9	38	19.0	0.8	18.4	
8/12/02	07:30:54	62.0	38	19.0	0.8	18.4	
8/12/02	07:30:55	62.0	76	19.0	0.8	18.4	
8/12/02	07:30:56	55.0	76	19.0	0.8	18.4	
8/12/02	07:30:57	55.0	0	19.0	0.8	18.4	
8/12/02	07:30:58	55.0	0	19.0	0.8	18.4	
8/12/02	07:30:59	55.0	62	19.0	0.8	18.4	

APPENDIX "A"

Table 2 - Partial typical day trace showing the manually -extracted LA Max in dB(A)

11.11.04

TIME-LA max dBA

6.26.49-93.4
7.11.51-74.0
7.22.24-83.2
7.35.51-77.7
7.45.11-81.0
8.03.33-79.9
8.20.35-76.5
8.21.38-94.0 at 994 Hz CALIBRATION TEST
8.38.03-82.2
9.00.55-88.5
9.03.28-73.8
9.10.07-83.0
9.14.57-82.1
9.25.09-82.3
9.27.05-80.2
9.34.35-79.7
9.36.30-79.6
9.43.21-76.2
9.46.02-79.2
9.48.23-88.4
9.52.08-84.3
9.55.48-69.2
10.01.49-73.3
10.04.16-84.0
10.06.38-76.0
10.08.10-81.3
10.19.36-79.1
10.22.24-78.7
10.32.20-80.8
10.46.19-78.6
11.01.48-85.9
11.07.37-84.8
11.09.24-77.2
11.27.37-85.3
11.53.57-84.7
11.55.54-74.5
11.57.43-87.7
12.01.01-82.1
12.35.47-75.2
12.38.52-85.7
12.48.04-82.1
12.55.00-75.7
12.59.32-76.3
13.03.46-89.5
13.05.51-82.3
13.13.34-71.9
13.19.37-82.0
13.22.12-70.9
13.43.36-75.8
13.54.13-75.4
14.00.47-79.1
14.07.18-76.7
14.36.21-83.7
.....continues . See files 200xnois.txt for details, where x is the year number

APPENDIX "B"

The Departure Ceiling Over Summer Hill

Figures from Airservices Australia Environment Branch report No. 1360 , ***"Short Term Study into Aircraft Noise and Flightpaths"***, February to May 2003, Summer Hill

Figure 7 All jet arrivals onto 34 Left for the period from 14/10/2002 - 14/4/2003.

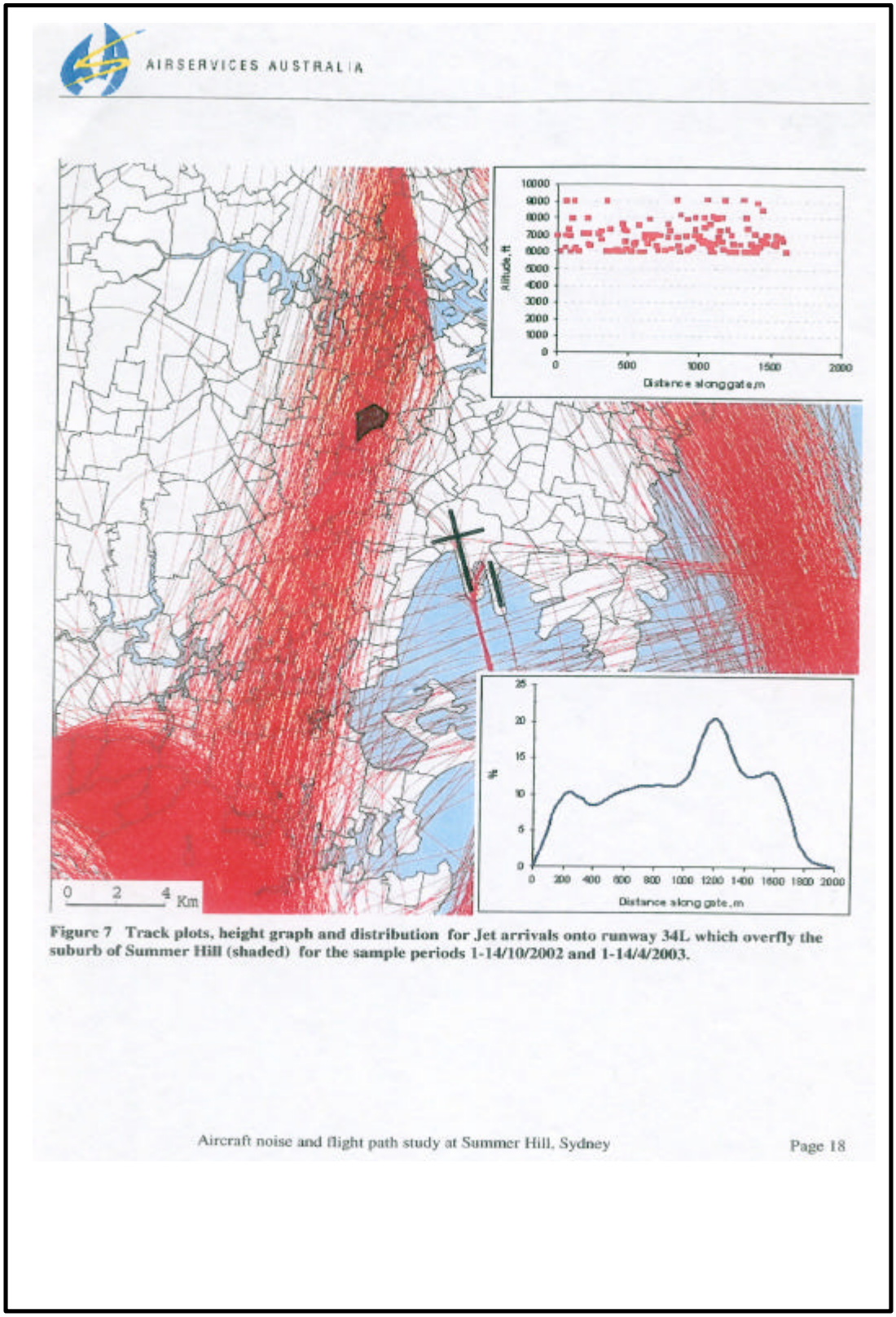

Figure 7 Track plots, height graph and distribution for Jet arrivals onto runway 34L which overfly the suburb of Summer Hill (shaded) for the sample periods 1-14/10/2002 and 1-14/4/2003.

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APPENDIX "B" Cont'd:

Figure 10 All jet departures from 34 Left in the same period.

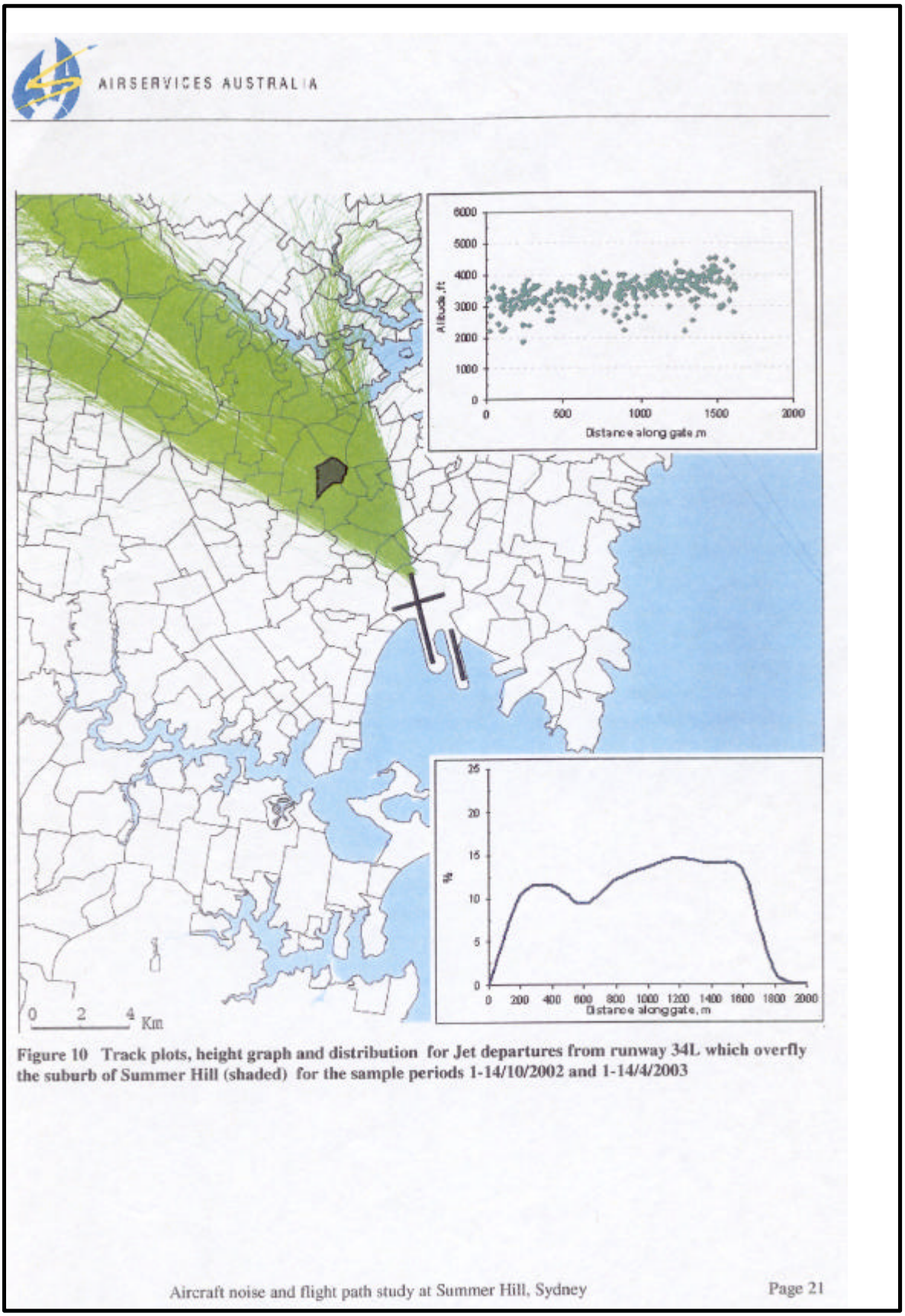

Figure 10 Track plots, height graph and distribution for Jet departures from runway 34L which overfly the suburb of Summer Hill (shaded) for the sample periods 1-14/10/2002 and 1-14/4/2003

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