The Acoustic Group
CONSULTING ACOUSTICAL AND VIBRATION ENGINEERS

48.5332.R2:MSC

7th November 2018

Tweed Shire Council
PO Box 816
MURWILLUMBAH NSW 2484

Attention: Ms. C. Forbes

Dear Sirs,

PEER REVIEW - ACOUSTIC ASSESSMENT
PROPOSED HELIPAD
477 URLIUP ROAD, BILAMBIL

The purpose of this report is to undertake an acoustic assessment of potential helicopter operations for a helipad located on private property at 447 Urliup Road, Bilambil.

An application for the helicopter landing pad has been submitted to Tweed Shire Council under Development Application 18.0637.

A previous application under DA 17.0805 was refused by the Council.

I have been requested by Council to review both development applications with respect to acoustic reports prepared by Craig Hill Acoustics.

My review of the previous application is set out in a separate report and recommended refusal.

This review relates to DA 18.0637 that included a noise impact assessment from Craig Hill Acoustics, dated 15 August 2018. The acoustic assessment provides in Table 5.2 a series of A-weighted noise levels recorded at five reference locations identified as being the results of testing a Bell 206B-III JetRanger conducted on Saturday, 28 October 2017. The testing occurred on the same day as nominated for the previous DA but includes additional noise data not presented in the acoustic assessment for the previous application.

In view of the different proposed operations, and different data I refer to DA 18.0637 as the "amended DA" and the Craig Hill Acoustics report of 15 August 2018 as the "second acoustic report".

The amended DA identifies that an application was for 10 trips per week (in and out cumulative with proposed hours of use between 6:15 am and 6:30 am seven days a week) with the helicopter utilising a one-way flight path to the helipad. The text in the second acoustic report identifies measurement results for a take-off and a landing at the helipad, utilising a curved flight path shown on page 6 of the report.

The second acoustic report also included noise associated from the operation of pumps and trucks utilising the subject site for commercial operations, which has no bearing of the assessment of helicopter noise.

The Statement of Environmental Effects accompanying the second DA refers to the helicopter is to be used for flying to and from work. This description may be considered as only one take-off and one landing per day, which implies for a maximum of 10 movements per week that on some days the helicopter will not fly.

To identify my experience in being able to undertake a review and respond to Council's further requests, I attach in Appendix A my curriculum vitae. In my CV I have highlight papers and reports prepared in relation to helicopter/aircraft noise assessments. In Appendix B I set out my experience in helicopter measurements/investigations.

On reviewing the second acoustic assessment, I find the Craig Hill Acoustics assessment is inadequate, contains a number of significant errors, and does not provide as a stand-alone report sufficient material to justify the acoustic conclusions.

With respect to the subject application the following errors are noted in identifying the proposed operations:

- The acoustic assessment utilised incorrect noise criteria applicable to helicopters and did not quantify whether the test flight results were associated with a take-off or landing of the helicopter.

- The acoustic assessment referred to Australian Standard AS 2363 that provides a methodology for the measurement and analysis of helicopter noise. This Standard is identified in the acoustic assessment as being used for the on-site measurements contained in the report.

- AS 2363 in Clause 4.5 identifies that for acoustic assessments the terminology used for helicopter operations is to consider noise with respect to "flight movements" where a take-off is a movement and a landing is a movement.

- AS 2363 does not define a helicopter "flight".

- The use of helicopter "movements" is to distinguish between the general concept of a flight of an aircraft, be it a fixed wing plane or a helicopter, that commences with a take-off and the flight (being successful) concluding with a landing such that an aircraft flight includes both a take-off and a landing, i.e. a "flight" normally involves two movements but for the subject application the SEE indicates that only one of the movements of the "flight" may occur at the subject site.

- AS 2363 recommends the conduct of four take-offs and landings with the helicopter at maximum loading that is representative of the proposed operations.

- Section 5 of the acoustic report provides measurements results that do not conform to AS 2363. The report does not provide the identification of the idling noise component, the hover component when the helicopter was approximately 3 m above ground level, the take-off component, or the landing component.

- There is no material in the assessment to indicate how many flights occurred.

When correcting the misuse of terminology by the author of the acoustic assessment report, then the revised application for a helipad at Lot 1 Deposited Plan 736658, 477 Urliup Road, Bilambil, is for a maximum of 10 movements per week by a Bell 206B-III JetRanger with an interpretation provided in the SEE that there would be a maximum of two movements on any day.

Clarification of Acoustic Criteria

The report from Craig Hill Acoustics claims (in Section 3.0) that "as New South Wales does not have recognised guidelines for Helipad the NSW Noise Control Manual will be used for the assessment".

This statement is incorrect on a number of grounds and reveals a lack of knowledge as to the appropriate criteria and assessment procedures for helicopter operations.

There is no document identified as *NSW Noise Control Manual*. There was a document issued originally by the State Pollution Control Commission in 1985 identified as the *Environmental Noise Control Manual* (the "ENCM"). The ENCM was subject to a number of updates including changing the authorship from SPCC to the EPA.

Chapter 165 of the ECNM provided noise criteria for helicopter landing sites, being a repeat of guidelines issued by the SPCC in 1982.

In 1990 the aircraft noise committee of Standards Australia issued a helicopter Noise Standard AS 2363 – 1990, that set out procedures for the measurement of helicopters and overcame a number of technical errors in the old SPCC helicopter noise guideline.

The 1990 version of AS 2363 included noise targets expressed as an LAeq contribution over a 12-hour period with different criteria for day and night.

Appendix A to AS2363 – 1990 set out the recommended noise targets that identified maximum noise level targets and LAeq targets for different types of receivers for both the day and night time periods.

With respect to the LAeq criteria, Appendix A in AS 2363 – 1990, suggested that in low ambient noise level environments that the LAeq criterion was either that set out in the table contained in the Appendix, or the ambient LAeq +10 dB whichever was the lower value.

A second version of AS 2363 was issued in 1999 and excluded the recommended noise targets and referred the reader to the appropriate Regulatory Authority.

The ENCM was discontinued as a result of the EPA/DECC issuing two policy documents, the *Environmental Criteria for Road Traffic Noise* and the *Industrial Noise Policy*. Neither of the two policy documents issued in 2000 and 2001, respectively contained criteria for helicopters.

Craig Hill Acoustics have failed to identify that in 2015 the New South Wales EPA confirmed they have no authority to control helicopter noise when in the air or on the ground, other than if the noise is generated from helicopter maintenance facilities.

The NSW EPA have acknowledged to a number of Councils that the control of helicopters in the air and on the ground falls under AirServices Australia.

The assessment of noise from aircraft (including helicopters) is based on the Australian Noise Exposure Forecast System (ANEF) which is an energy average noise level over 24 hours a day for an average day, based upon the total number of operations over an entire year.

The Council may consider that there is a general requirement under the *Environment Planning and Assessment Act* to take account of potential adverse impacts may occur from the development and could request information in relation to the helicopter utilising the subject site to satisfy that general requirement.

Appendix C (to this report) provides an extract from the acoustic report forming part of an EIS for a helipad at Trinity Point. The EIS has been submitted to the Department of Planning and has been on public exhibition. The extract provides more detail as to the development of acoustic criteria for helicopter landing sites in NSW.

Under the ANEF system for residential receivers a level not exceeding 20 ANEF is considered to be acceptable for residential occupancy. It is noted that the ANEF system was based upon socio-acoustic surveys for persons having an exposure to aircraft noise of not less than two years.

For persons newly exposed to aircraft operations is generally accepted that there is a different level of sensitivity to such operations. In the case of the development of a new flight path in an area that is not subject to aircraft noise then this different level of sensitivity has been applied by the Federal Airports Corporation for the second Sydney Airport Environmental Impact Statement by the allocation of a correction factor of 7 ANEF units to provide an acceptable limit of 13 ANEF.

In dealing with a 24-hour Leq then the equivalent design target would be 13 ANEF + 35 = 48 dB(A) Leq. Noting that aircraft operations between 7 pm and 7 am under the ANEF system have correction factors to the predicted noise levels that are used for operations between 7am and 7pm.

In late 2017, the Chief Judge of the Land and Environment Court of New South Wales issued a Judgment in relation to an existing helipad at the Highland Heritage Estate becoming the Orange East heliport, with a capacity for a greater number of movements than that that had been approved for the existing helipad.

The Judgment from the Chief Judge as Nessdee Pty Ltd v Orange City Council [2017] NSW LEC 158 summarises the acoustic issue/criteria commencing at paragraph 19 of the Judgment. The Judgment confirms the use of ANEF 20, with the nominal conversion of 35 to an LAeq over a 24-hour period, was accepted by the two acoustic experts in that matter (one of whom was the author of this report).

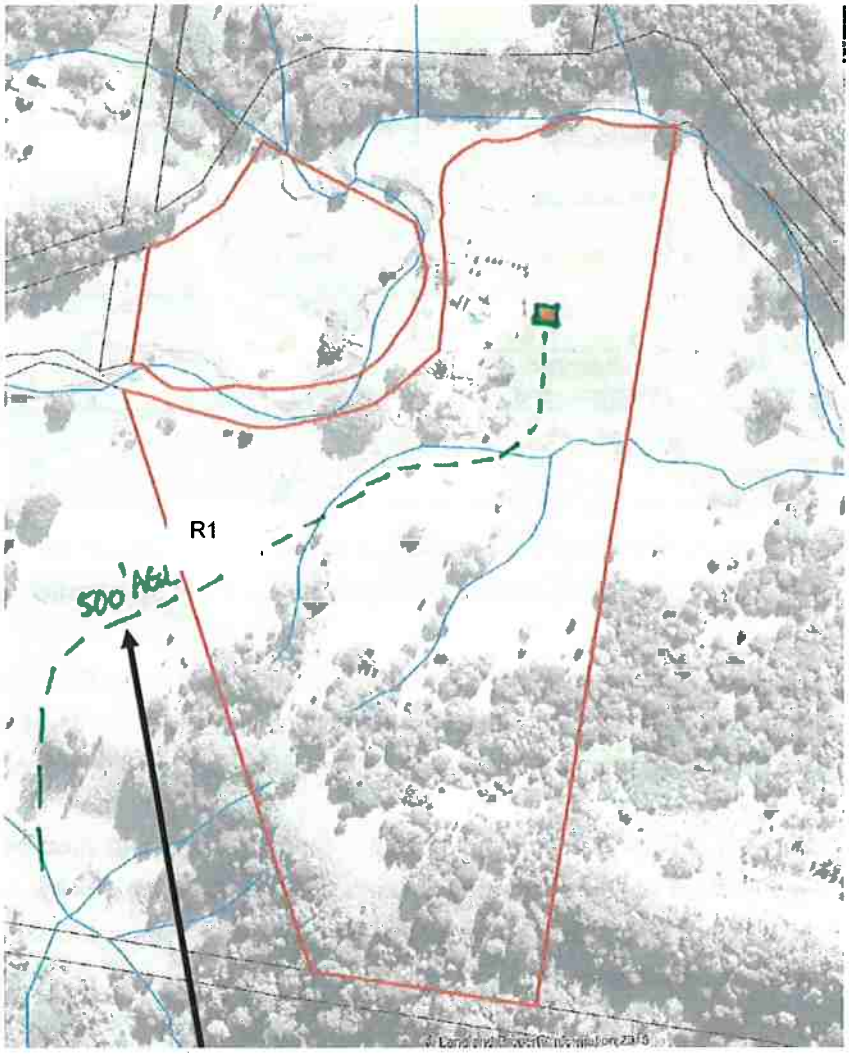
The measurement procedures for the assessment of the Orange East heliport followed that of AS 2363 – 1990, of which the author of this report was a significant contributor to that Standard.

Appendix D provides a copy of the Nessdee Pty Ltd Judgment.

The Proposed Application

The second Craig Hill Acoustics report identifies in Table 2.1 distances from the receiver locations from the "source", and provides an aerial photo with the relevant locations overlaid on that photo as reproduced on the following page.

The report also includes a flight path and identification of the subject site that reveals a curved flight path and not a straight in and straight out flight path, normally utilised for one-way helipads.



Examining the identification of the various receiver locations and the proposed flight path, reveals there would be some difficulty in accepting the Craig Hill Acoustics distances provided from the "source" (assumed to be the subject helicopter) and the above flight path, as shown in Table 2.1 (reproduced below).

Table 2.1

Receiver	Distance from source			
	Description	metres from pad	metres from flight path	altitude of aircraft feet at max exposure
R1	Residential	477	477	>500
R2	Residential	280	280	0-100
R3	Residential	365	365	0-100
R4	Residential	221	221	0-100
R5	Residential Hogans road	504	504	elevated receiver above pad

If one considers that the distance from the helipad to residential location R1 is 477 m and that the flight path is to the south of location R1 and greater than 500 feet, I have difficulty in ascertaining how the helicopter can be 477 m from the flight path.

The position in the flight track where 500 feet occurs is not identified in the report. Even if one assumed that at location R1 the helicopter could be at 1000 feet and say 50 m to the south of R1, then it is impossible for the flight path to be 477 m from R1.

Similarly, if R5 is 504 m from the flight path, as the flight path proceeds to the south, and then turns to the south-west across a creek, then in plan view the helicopter would be less than 500 m. The altitude of the aircraft at the maximum exposure as expressed for R5 is meaningless.

With respect to the flight path that is shown in the Craig Hill Acoustics report there is the need for clarification from an aviation expert to determine whether the flight path satisfies the requirements of AirServices Australia and what operating limits would occur for the use of the nominated flight path in terms of strong winds.

Normally a helicopter pilot prefers landing the helicopter into a wind or a headwind component into wind and similarly for take-off. The flight manual for Bell 206B-III JetRanger identify that operations up to 17 knots as crosswind and tailwind components can occur. Accordingly, there are limitations for the subject helicopter with respect to operations that may occur with tailwind. There could be at times prevailing weather conditions at the subject site that may prohibit the operation of the helicopter along the flight track that has been nominated.

For the nominated turbine helicopter (AS350B) used in the East Orange Heliport matter the Flight Manual for that aircraft identified "the final approach should be made into the wind at a low sink rate and recommended airspeed of 65 kt".

Accordingly, under Civil Aviation Regulations the helicopter is required to be flown in accordance with the Flight Manual.

In the Nessdee Judgment there is identification of the need for multiple flight paths to ensure there is a headwind component (into wind) for landings.

If the subject site was to experience a strong north-easterly wind then there would be an expectation for the helicopter to take off towards the north east (or north or east) to have a headwind component, gain elevation, and then track out towards the southern entry point. If that scenario was to occur then the flight path distances provided by Craig Hill Acoustics would be different and could have the helicopter closer to receiver locations R3 and R2, and therefore potentially higher noise levels.

If the landing site was subject to a strong southerly wind, then the helicopter landing would have to utilise a final approach generally from the north so as to have an appropriate headwind component. Such an approach could either come into the helipad with a track from the west closer to R4 and R3, or from the east and be closer to R2 and R3 than depicted in the Craig Hill Acoustics report.

If, however the nominated one-way flight path is to be utilised for the subject site then, subject to verification of a flight track that is suitable for helicopters, there may need to be limitations on the use of the helipad under various wind conditions.

If there was a required to introduce an additional flight path(s) to cater for different wind conditions, then the subject application will have to be reassessed for those flight paths where the application must include additional acoustic measurements.

Measurement Procedures

The procedures and requirements for the noise testing of helicopter operations are set out in Australian Standard AS 2363 – 1990 (*Acoustics – Assessment of noise from helicopter landing sites*) and AS 2363 – 1999 .

Both versions of the Standard identify methodology that separates the individual flight components between landing and take-offs, versus hover, and when on the ground at idle (identified as flat pitch idle)

The Standard recommends the conduct of four take-offs and landings with the helicopter at a maximum loading rate that is representative of the proposed operations.

Section 3 of the Craig Hill Acoustics report identifies that AS 2363 was used as a guideline for on-site measurements

Section 5 of the second acoustic report identifies a sequence of flights that would permit the identification of the idling noise component, a hover component when the helicopter was approximately 3 m above ground level, the take-off, and a landing.

The second acoustic report, whilst identifying in the second paragraph of Section 5 "the flights were carried out ...", there is no material to indicate how many flights occurred.

There is no listing of the flights that occurred, the time of the flights or graphs of the variation in noise over time to assist in comprehending what testing was undertaken.

However, Section 4.1 of the acoustic report indicates only one sound level meter was used. Therefore, I assume there were at least five flights on the day. If that scenario did occur, then there were not four flights per location as suggested in AS 2363.

If there were four flights per location, then there would have been at least 20 take offs and 20 landings.

There is no information in Table 5.2 to indicate the noise levels associated with a take-off versus a landing, or any average level of take-offs and landings. One could assume that if the results accord with the order set out in Section 5 that the first line of data is a take-off and the second line is a landing.

However, the header of Table 5.2 only refers to "Flight". There is no explanation of what "Flight" means.

As the order of flights identifies idle, hover and take off/return on flight path, one would expect Table 5.2 to include all of that data.

In aviation terms the aircraft operation occurs from engine start to engine shutdown.

On the material provided in Section 5 of the second acoustic report I am unable to ascertain what the "LAeq Flight" results mean. Are they the total of the idle + hover + take off for the first line of data or just the flying component and therefore missing the idle and hover components?

Similarly, if the second line of data is assumed to relate to the landing operation then is the "LAeq Flight" data the total of the idle + hover + landing or just the flying component?

I have difficulty with the Ambient material set out in the 7th column. All the results are 45 dB(A).

It is difficult to comprehend how 5 different receiver locations could have the exact same Leq (15 minute) ambient level before and after (each?) test, that in any event is not an ambient measurement in accordance with AS 2363.

With respect to the acoustic data it would appear that the measurements were not conducted in accordance with the requirements of the Standard.

Under Clause 6 of AS 2363 the ambient noise measurements should be conducted over the operational period of the landing site, although the relevant Statutory Authority may find acceptable a sample composed of four measurements each of period 20 minutes spread over the operational period.

There is no identification in the acoustic assessment of what constitutes the ambient environment and whether the measured acoustic environment is typical of the area.

With respect to the noise measurements there is no information contained in the Craig Hill Acoustics report to identify capacity of the helicopter during the testing, and whether there was only the pilot on board (that may be the normal operation) and therefore not at the maximum loading weight (as required by AS 2363).

It may be the case that in this situation a single person on board may be the normal operating scenario and therefore should be a condition of consent. However, the acoustic report is silent on that matter.

Acoustic Assessment

Notwithstanding the inadequacies of the material set out in the second Craig Hill Acoustics report, I have been instructed by the Council to see if I could utilise the data and determine the range of noise exposure levels that could occur as result of the proposed development.

In undertaking that exercise I have to make a number of assumptions as to the basis of the assessment.

The SEE accompanying the second application identifies a maximum of 10 movements per week and typically a week would be restricted to 5 days of operations. Therefore, a reasonable person would consider that the assumption is one take off and one landing per day.

The ANEF system looks at an average day over the entire year of operations. Technically if one considers a limit of 10 movements per week then on an average over a year there would be slightly less than one landing and one take-off per day.

AS 2363 requires at least four sets of measurements per location from which an average L_{AE} (sound exposure level – see clause 4.14 of AS 2363-1990) for each mode of the testing can be determined for each receiver location. It would appear on the material provide that the required average L_{AE} was not obtained.

Accordingly, on adopting the conservative approach of utilising one landing and one take-off per day every day of the week (which is not to be the case) then utilising those movements one can determine the ANEF value.

Table 5.2 of the Craig Hill Acoustics report has not provided the calculated LAeq level for the two movements per day.

For the nominated hours of operation and the advice that the helipad is for private purposes, specifically to provide the applicant with personal transport to and from work, then the flight prior to 7 am is assumed to be a take-off and as such occurs in the ANEF night period, whilst the landing would occur prior to 7 pm and is assumed to therefore to occur in the ANEF daytime period.

With respect to the idle and hover components I have utilised other measurements of a Bell 206 JetRanger II for a number of Sydney CBD Heliport assessments and adjusted the L_{AE} for distance attenuation to determine a contribution from those components.

It is noted that for the start up or shutdown of a helicopter there is an extended period of time (typically 2 minutes) to permit stabilisation of engine temperature. The 30 second idle period for testing purposes (from AS2363) is to permit an audible break between individual movements. I wrote the test procedure in AS 2363 based on my previous testing of helicopters.

For the hover component analysis, I have used the 30 seconds identified in the flight procedure noting that in some case the in-ground effect hover can be more than 30 seconds.

On the basis of the above assumptions and the data from Table 5.2 in the second acoustic assessment (with the qualifications described above) the following Table presents the derived contributions for each location.

Location	Mode	Leq dB(A)	Time (secs)	L_{AE}	Movements		LAeq (24 hrs)	ANEF
					day	night		
R1	T/O	64	181	86.6	1	0	37.2	
	Land	68	160	90.0	0	1	46.7	
	Idle	54.7	120	75.5	1	1	33.1	
	Hover	60.7	30	75.5	1	1	33.1	
	Cumulative						47.5	12.5
R2	T/O	62.2	181	84.1	1	0	34.8	
	Land	65	160	86.4	0	1	43.0	
	Idle	59.3	120	80.1	1	1	37.7	
	Hover	65.3	30	80.1	1	1	37.7	
	Cumulative						45.4	10.4
R3	T/O	61.4	181	82.8	1	0	33.4	
	Land	64.7	160	85.7	0	1	42.3	
	Idle	57	120	77.8	1	1	35.4	
	Hover	63	30	77.8	1	1	35.4	
	Cumulative						44.2	9.2
R4	T/O	65	181	85.8	1	0	36.4	
	Land	65	160	86.9	0	1	43.5	
	Idle	61.4	120	82.2	1	1	39.8	
	Hover	67.4	30	82.2	1	1	39.8	
	Cumulative						46.6	11.6
R5	T/O	64	181	85.8	1	0	36.4	
	Land	62	160	84.3	0	1	40.9	
	Idle	54.2	120	75.0	1	1	32.6	
	Hover	60.2	30	75.0	1	1	32.6	
	Cumulative						43.1	8.1

From the above results it can be seen that the proposed operations with a take-off before 7am and a landing between 7am and 7pm on each day would result in an ANEF less than 13, which is the appropriate criterion for a new flight path in an area not previously exposed to helicopter noise.

Under the requirement to consider potential adverse impacts under the *Environment Planning and Assessment Act,* the maximum noise from the helicopter operations significantly exceeds the "ambient Leq" of 45 dB(A) identified in the second acoustic report (for unspecified times) and has the potential to give rise to sleep disturbance at the residential dwellings identified as R1 – R5 inclusive.

Based upon the maximum level from helicopter movements recorded at locations R1 – R5 (Table 5.2 of the second acoustic report) there is the potential for sleep disturbance during the "night period". The maximum levels are greater than the 65 dB(A) limit proposed in the Nessdee P/L matter. This limit was from the EPA sleep arousal criterion of background + 15 dB(A).

Based on the "ambient" level of 45 dB(A) obtained in the day it is not unreasonable to assume a background level prior to 7am to be less than 40 dB(A).

On that basis the maximum levels provided by Craig Hill Acoustics are significantly greater than background + 15 dB(A) being the general sleep disturbance limit provided by the EPA in their *Noise Guide for Local Government,* or the 52 dB(A) limit nominated by the EPA in the *Noise Policy for Industry* document.

If the helicopter operations were restricted to daytime operations under AS 2021 (between 7am and 7pm Monday to Saturday) and 8am to 6pm on a Sunday (to accord with the EPA's definition of daytime) then the issue of sleep arousal would be resolved and the resultant ANEFs would be reduced. For that scenario I have determined the highest ANEF being a value of 7.7 would occur at location R1.

Conclusion

Development Application DA 18.0637 for the use of a helipad located on private property at 447 Urliup Road, Bilambil, included a noise Impact assessment from Craig Hill Acoustics, dated 15 August 2018.

The acoustic assessment is inadequate in terms of its technical content and failed to provide sufficient information, as required by Australian Standard AS 2363, to provide the resultant noise impact of the proposed operations in terms of an LAeq, 24-hour.

Craig Hill Acoustics are clearly unaware of the appropriate acoustic criteria applied to helicopters in New South Wales. As such they have not assessed the application correctly. On the basis of the report that accompanied the application, the application should be refused by Council with **one of the grounds of refusal being an inadequate acoustic assessment.**

However, I am instructed by the Council as part of my review of the application to use my best endeavours to determine whether noise emission from one take-off and one landing a day from the subject site could satisfy the relevant acoustic criteria when assessed utilising the Australian Noise Exposure Forecast (ANEF) system.

For an area subject to existing aircraft noise, the target of ANEF 20 is nominated in Australian Standard AS 2021, and documentation from AirServices Australia, as being an acceptable external noise level from aircraft operations with respect to residential developments.

In view of the ANEF system (and recommended criteria) being based upon persons being pre-exposed to aircraft noise, the Commonwealth Government via the Federal Airports Corporation and the Department of Transport has identified for new flight tracks or airports that ANEF 13 is to apply for greenfield sites (also confirmed in the Nessdee matter).

The acoustic assessment submitted with the application does not (as required by AS 2363) provide noise information related to the hover mode, or the idle mode of the helicopter, but identifies noise levels with respect to the "flight".

The assessment of the helipad under the ANEF system involves all noise associated with the helicopter that is detected at receiver locations from start-up of the helicopter to shut down of the helicopter.

In this regard additional data for the nominated helicopter type has been extracted from acoustic measurements conducted for the Sydney CBD heliport where such material was placed in the public domain and was subject to independent auditing via a Commission of Inquiry that verified the accuracy of the results.

The subject application under DA 18.0637 proposes operations in the morning prior to 7 am, which by way of the ANEF system involves a weighting factor to be added to those flights/operations of +6 dB as a result of night-time operations being considered equivalent to 4 day time operations.

On the basis of the restriction of 10 helicopter movements per week and a maximum of two movements per day, the various levels in terms of the ANEF have been determined by utilisation of the A-weighted levels with a correction factor of -35 dB being a method originally proposed by the New South Wales State Pollution Control Commission in 1982. The -35 dB correction factor has also being used by the Civil Aviation Authority for their assessment of helicopter transit lanes in Sydney and by AirServices Australia in their assessment of take-off operations to the north from the third runway at Sydney Airport (Runway 34R) being a separate exercise some year later after the original EIS for the Third Runway.

The issue of helicopter operations from the subject site prior to 7 am, Monday to Saturday, or prior to 8 am on Sundays occurs in the AirServices/EPA night-time respectively.

The maximum levels obtained by Craig Hill Acoustics at each of the five reference locations represents noise levels significantly greater than that recommended by the EPA in their *Noise Policy for Industry* or the *Noise Guide for Local Government*.

Night-time operations exceed the noise limit nominated for the East Orange heliport;

It is recommended that no helicopter operations be permitted prior to 7 am. Therefore, to maintain the general 12 hour window suggested in the application, **for Monday to Saturdays the operating times should be restricted to 7 am to 7 pm, whilst on Sundays in terms of convention for night-time period used in acoustic Standards it may be appropriate to restrict the operating hours from 8 am to 7 pm.**

The use of the nominated single flight path does not involve a straight in approach from an elevated gate external to the subject site, and then directly straight down to the helipad.

From the Craig Hill Acoustics report from the entry gate to the south-east of location R1 there is a straight line track that then incorporates a slight right-hand curve and then a 90° left hand curve into the helipad. **Whether the nominated flight track satisfies aviation requirements is a matter outside of my expertise and should be evaluated by an aviation consultant with expertise in helicopter operations.**

The flight path that has been nominated for the application is assumed to be the flight path that was tested upon which the noise exposure levels have been determined. Therefore, **the subject helicopter must fly the nominated flight path on both arrivals and departures and is not permitted to deviate from the nominated flight**

path.

At times, there will be certain weather conditions that exceed the operational limits identified in the flight manual for the subject helicopter and as such would prohibit the use of the flight path. This would require the helicopter to not take off from the site, or on arriving to the area the helicopter would have to seek an alternative landing site.

If the use of only the flight path that has been provided in the application provides limitations to the subject operation, then the use of alternative flight paths for the initial take-off leg for the final approach would need to be the subject of a separate application/modification which must be supported by appropriate and proper acoustic measurements.

The application relates to a specified helicopter type upon which noise levels have been obtained and used for assessing the application. There is no information contained in the application documentation to identify the loading of the helicopter, or the number of persons on board. One can automatically guarantee that there was at least one person on board (being a pilot). As the helicopter was not tested at maximum load (as required by AS 2363) then a condition of consent **should restrict the operations to a Bell 206B JetRanger-III with a maximum of two persons on board.**

Yours faithfully,

THE ACOUSTIC GROUP PTY LTD

STEVEN E COOPER

APPENDIX A:

The Acoustic Group
CONSULTING ACOUSTICAL AND VIBRATION ENGINEERS

CURRICULUM VITAE

STEVEN E. COOPER - DIRECTOR

DATE OF BIRTH: 15 June 1952

QUALIFICATIONS:

Bachelor of Science Engineering (Electrical) 1978, University of NSW

Master of Science (Architecture) 1990, University of Sydney

MEMBERSHIPS:

Fellow, Institution of Engineers, Australia
Chartered Professional Engineer

Member, Institute of Noise Control Engineering
Member, Australian Acoustical Society
Member, Acoustical Society of America

Member of Standards Association of Australia Committee AV/10 – Whole Body Vibration (1986 to 2013), Committee EV/11 – Aircraft & Helicopter Noise (1986 to 2013), AV/4 – Architectural Acoustics (1996 – 2000), and Committee EV/10/4 – Railway Noise (1998 to October 2007)

NSW Division, Australian Acoustical Society
Membership Committee 1978 to 1997

EXPERIENCE:

The Acoustic Group Pty Ltd
Incorporated in 2003

Steven Cooper Acoustics Pty Ltd
Incorporated in 1995

James Madden Cooper Atkins Pty Ltd
Incorporated in 1981

James A. Madden Associates Pty Ltd
Appointed Associate Director 1980
Appointed Associate 1979
Appointed Engineer 1978

The Acoustic Group was formed to provide specialised services and research in Acoustics and Vibration and draws on the considerable experience of Mr. Cooper from his position from 1982-1995 as Principal and Partner of James Madden Cooper Atkins and from 1995-2003 as Principal of Steven Cooper Acoustics. His particular areas of acoustical expertise include machine and vibration monitoring, acoustical design of auditoria, studios and entertainment venues, traffic and helicopter noise, laboratory instrumentation, precision analysis system, legal assignments and expert witness.

He has considerable experience in vibration measurement and assessment in industry for both Machinery Operating Condition and Occupational Exposure Levels.

His experience in the measurement and assessment of noise emission from industry and licensed premises is extensive having produced numerous assessment reports and noise control designs for clients, statutory bodies and courts. He has been an invited Guest Lecturer on Noise Assessment to NSW Policy Academy for their Noise Familiarisation Course run by the State Pollution Control Commission, a guest lecturer for the Faculty of Architecture at the University of NSW, and a lecturer on noise issues for seminars/workshops run by the Australian Industries Group, the Australian Environment Network and NEERG Seminars.

He is an acknowledged leader in the measurement, assessment and design of helipad/heliport operations, military aircraft noise assessments, and has been a major contributor to various Australian Standards. Mr. Cooper is the recipient of an Engineering Excellence Award in the Environment Category from the Institution of Engineers in 1997 for the TRW No. 2 Forge Project.

In recent times Mr Cooper has been involved in identifying the acoustic signature of wind turbines as part of a research program into ascertaining what causes rural residents to complaint about wind turbines. His research has led to the development of new techniques for analysis and presentation of the data and in particular the identification of a dynamically pulsed amplitude modulation that occurs across the entire audio spectrum and is pulsed at an infrasound rate. This work has led to investigations into the area of audible and inaudible "hearing" and being invited by the Acoustic Society of America to be a member of their Wind Turbine Working Group.

Projects in which he has been involved include the ICI Botany Complex (Noise and Vibration), APM Matraville Paper Mill (Site noise control), Manildra Flour Mill, Sydney CBD, Granville & Gosford Heliports, ANEF Validation and NPD testing for F111, FA-18, JSF aircraft, Iroquois, Squirrel, Sea King, Sea Hawk, Blackhawk, Super Seasprite, Tiger and MRH90 helicopters, acoustical assessments for Licensed Premises, Studios, Auditorias etc., and the Cape Bridgewater Wind Farm Disturbance Complaint Investigation.

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APPENDIX B: Relevant Helicopter Noise Experience for Steven Cooper

In relation to helicopters over some 40 years, my experience involves:

- I have conducted assessments in excess of 50 domestic/commercial helipads around Australia incorporating the following helicopter types:

  AW 139, Bell 47G, Bell 206B JetRanger, Bell 206 LongRanger, Bell 212, Bell 222UA, Bell 412, Aerospatiale AS341, AS350B, AS355F1, AS355F2, AS365C, AS365N1, Sikorsky S76A, Sikorsky S76B, MBB105, BK117, Enstrom F28, Agusta A109A, Robinson R22, R44, R66, Hughes 300, 500C, 500D, McDonald Douglas 500E, Eurocopter EC120 and Eurocopter EC135.

- For military operations I have conducted measurements for Blackhawk, Seahawk, Iroquois, Kiowa, Sea King, Squirrel, Super Seasprite, Tiger ARH and MRH-90 helicopters.

- I have provided acoustic evidence of helipad/heliport proposals in Land & Environment Court (NSW) and Planning Tribunal Appeals (VIC) on behalf of Applicants. I provided expert acoustic evidence in relation to the Sydney CBD Heliport before a Commission of Inquiry, appearing for both the Applicant and the NSW Department of Transport.

- In terms of helicopter measurements and assessments, I have also run noise training days in Brisbane, Sydney and Melbourne for pilots of the Helicopter Association of Australia. During those courses, I have sought to educate pilots on flying techniques to reduce noise impacts and find that those techniques are different to those normally encountered in standard pilot training.

- Various flight techniques have been developed from helipad operations where I sought to minimise the noise impact and therefore, experimented with different flight profiles, power settings, etc. to minimise noise. The primary reason for different flight operations for different helicopters is when the helicopter on descent has a certain rate of descent and forward speed it can generate a blade vortex interaction (where the blade passes through the vortex thrown off the preceding blade and causes an impulsive noise). Different types of helicopters that utilise different size blades, number of blades, with fixed or flexible rotor heads, require different flight profiles to address the matter of blade vortex interaction (which in America is identified as blade slap).

- In addition to many hours of testing of helicopters and seeking to reduce noise impacts of such helicopters, I have been intimately involved in the development of Australian Standard AS2363 for helicopter noise. I was requested to join the sub-committee on aircraft noise by the NSW SPCC as a result of my expertise in helicopter and aircraft noise assessments. Later the sub-committee became a full committee requiring committee members to represent a national organisation. Originally, I was on the full committee representing the Association of Australian Acoustical Consultants but when my firm left that organisation, I could no longer represent AAAC on that committee, and I became a committee member of EV11 as the representative of the Helicopter Association of Australia.

- For 22 years, I represented Australia as a member of the Acoustics Committee of the Helicopter Association International and also a member of the HAI Fly Neighborly Committee. In my capacity as a member of those committees, I have been involved in the HAI's Fly Neighborly Guide and in actual fact, conducted a review of that Guide in 1995 where I found there were a number of errors in the Guide, such that the Guide did not agree with certification data provided to me from various manufacturers.

- I prepared the Australian Fly Neighbourly Guide for the Helicopter Association of Australia and during the course of the preparation of that document, I uncovered the discrepancies in the HAI Fly Neighborly database and communicated to the HAI Acoustics Committee of these errors. I communicated with Mr. Charles Cox of Bell Helicopters, who was Bell Helicopter's acoustic specialist and was also on the Acoustics Committee of the HAI. On checking my analysis, Mr. Cox confirmed the errors in the graphs contained in the HAI Fly Neighborly Guide. I provided the material to the HAI for the corrected graphs and that material has been incorporated in the current version of that document.

- I am familiar with the measurement and assessment procedures set out in ICAO for helicopter operations and have attended helicopter manufacturing facilities in the US and France to meet with their acoustics persons to discuss problems with certification data for comparison with real world operations. Accordingly, I have provided advice/comments on helicopter noise certification and testing to Bell Helicopters, McDonald Douglas Helicopters and Aerospatiale Helicopters, as well as having discussed and provided advice to the British Helicopter Association, the Hawaii Helicopter Association, New York Helicopter Operators Group and the Helicopter Association of Australia.

- I have conducted Noise Power Distance testing of 7 helicopters so as to provide the database set for use in the Integrated Noise Model. The US Aircraft Standards committee SAE-A21 confirmed I was the first person to undertake a validation exercise for helicopter NPDs. My work identified errors in the INM lateral attenuation calculations that has led to the US Federal Aviation Administration altering the lateral attenuation algorithms for helicopters and installing a switch in INM version 7 that permits the SAE Air 1751 lateral attenuation to be turned off by the user of INM.

- I undertook research into Helicopter noise impact as part of a PhD thesis at Sydney University. The investigation was changed into a PhD thesis into aircraft noise propagation. I have investigated lateral attenuation, atmospheric attenuation and directional noise emission from helicopters and military jet aircraft as part of this research work.

- I have carried out the ICAO certification of the Tiger Air Reconnisance Helicopter and the MRH90 Helicopter as well as developing the NPD curves for both helicopters.

- I have participated as part of a working group for the US Department of Defense and the Australian Department of Defence looking into the application of NoiseMap for Australian operations of which the research work presented at the 2006 Australian Acoustic Society conference has highlighted a number of issues for NoiseMap that is to be investigated by the working group.

APPENDIX C: Extract from Acoustic report for Trinity Point Development

4.0 ACOUSTIC CRITERIA

The revised Secretary's Environmental Assessment Requirements (SEARs) for the Trinity Point Morisset Park Helipad requires the noise impact report to consider CASA and EPA guidelines.

The CASA CAAP 92-2 "*Guidelines for the establishment and operation of onshore Helicopter Landing Sites (HLS)*" cited in the SEARs does not provide any acoustic criteria. There are no current EPA Guidelines specifically for helicopter noise as it has been established the EPA have no authority (noise wise) to control helicopters.

A guideline issued in 1982 by the SPCC (now EPA) and contained in their Environmental Noise Control Manual is redundant (as the Environmental Noise Control Manual has been superseded). The documents replacing the Environmental Noise Control Manual do not specify noise criteria for helicopter operations.

In dealing with an acoustic assessment of helicopters, there is often confusion about the noise criteria that applies to a helipad. This is because different noise criteria have been specified over the years with different interpretations as to what components of helicopter noise are controlled by the EPA or AirServices Australia.

Whilst verbal advice has been provided to The Acoustic Group from the NSW EPA and AirServices Australia that noise from all helicopter operations are the responsibility of AirServices Australia, and are assessed in terms of the ANEF criteria, there is no written advice as to the appropriate acoustic criteria now applied to helicopters.

Matters concerning acoustic criteria raised during the public meeting about the preliminary results of the helicopter testing at Trinity Point, and the following explanation is provided to address this potential confusion. While EPA officers have provided verbal advice as to helicopter noise criteria, the EPA/DECCW has not publicly addressed the changes in helicopter noise assessment procedures.

With the introduction of helicopter operations from television stations in the late 1970s the general acoustic assessment for helicopter operations was conducted using Australian Standard AS 1055 *Noise Assessment in Residential Areas.* After that time various acoustic criteria have been used in NSW for the assessment of helicopters

The Principal of The Acoustic Group has been involved in the measurement, review and assessment of helicopter operations since 1978 and a full CV in relation to helicopter experience is available if required.

The development of various helicopter noise guidelines or Standards used in Australia rely upon the criteria specified for aircraft noise that is set out in Australian Standard AS 2021 Acoustics – Aircraft noise intrusion – Building siting and construction.

AS 2021 utilises a noise exposure system calculated in Australian Noise Exposure Forecast (ANEF) units, that takes into account the following features of aircraft noise:

(a) The intensity, duration, tonal content and spectrum of audible frequencies of the noise of aircraft take offs, approaches to landing, and reverse thrust after landing (for practical reasons, noise generated on the aerodrome from aircraft taxiing and engine running during ground maintenance is not included).

(b) The forecast frequency of aircraft types and movements on the various flight paths, including flight paths used for circuit training.

(c) The average daily distribution of aircraft arrivals and departures in both daytime and night-time (daytime defined as 0700 hours to 1900 hours, and night -time defined as 1900 hours to 0700 hours).

The ANEF was developed in the early 1980's following a major socio-acoustic investigation undertaken by the National Acoustics Laboratories ("NAL") to assess the impact of aircraft noise on residential communities in Australia. The NAL study led to the development of a dose-response curve to identify the response of the community to the ANEF exposure level leading to an acceptable aircraft noise exposure defined in AS 2021 as being less than ANEF 20, and an unacceptable level of aircraft noise exposure above ANEF 25.

The ANEF system utilises the Effective Perceived Noise Level as the measurement parameter of an aircraft flyover. A general approximation between ANEF and dB(A) Leq is a difference of 35 dB.

Australian Standard AS2021 was first published in 1977 (using the American NEF system), then revised in 1985, 1994, 2000 and 2015 using the ANEF system.

4.1 NSW SPCC Helicopter Guideline

In 1982 the NSW State Pollution Control Commission ("SPCC") advised the helicopter industry that, on a noise basis, it legally had control over helicopter operations and introduced noise criteria that covered both operations on the ground and in the air. The SPCC helicopter noise criteria were subsequently set out in a guideline (Chapter 165) contained in the *Environmental Noise Control Manual* ("the EPA Helicopter Noise Guideline").

At that time, the legal position as to responsibility was never placed in the public domain by the SPCC (EPA), despite requests from the helicopter industry for a copy of the "legal position".

In 1982 all helicopter operations were controlled by the SPCC/EPA as helipads were classified as Scheduled Premises under the Noise Control Act. Under the EPA Helicopter Noise Guideline, helipads and heliports were required to satisfy a maximum noise level limit and an energy average noise limit depending upon the time of operation of the helipad. At the release of the EPA Helicopter Noise Guidelines, the SPCC cited the relationship of ANEF + 35 = Leq dB(A) as previously used (and continued to be used) by the Department of Aviation/Civil Aviation Authority/Air Services Australia.

The EPA Helicopter Noise Guideline were identified as being based upon the aircraft noise acceptability target of 20 ANEF (Australian Noise Exposure Forecast) for a heliport having 50 movements per day, where both the Leq target of 55 dB(A) and the maximum level of 82 dB(A) were mathematically related to the 20 ANEF value.

Due to the mathematical relationship between the maximum level and the Leq level, the consequence of a helipad having a lower number of movements would (for the same Leq level) result in a higher maximum level criterion.

The EPA Helicopter Noise Guideline did not provide the corresponding equivalent maximum level for a helipad with having, for example only 8 movements a day.

Persons experienced with the Leq formula (in the EPA Helicopter Noise Guideline) would be aware the EPA formula is mathematically incorrect. The Leq formulae is a parabola. For high usage helipads the formula provides a point at which the higher the number of helicopters movements, the Leq level would be reduced below the ambient Leq level, which is impossible. Therefore, to be technically correct the Leq must be expressed as a contribution (as confirmed by the Commission of Inquiry into the proposed Sydney CBD Heliport – discussed below), excluding the ambient Leq component in the EPA helicopter Leq formula.

As a result of the heliport criterion set out in the EPA Helicopter Noise Guideline, for helipads in proximity to residential premises the governing limit was the maximum level criterion, not the Leq level.

To the best of our knowledge all Land & Environment Court matters pertaining to helicopter applications (from 1982 up until 1993) were assessed against the EPA Helicopter Noise Guideline.

In 1999 and 2000 the EPA issued the *Environmental Noise Criteria for Road Traffic Noise* and the *Industrial Noise Policy*, which replaced parts of the *Environmental Noise Control Manual*. The EPA confirmed that the *Environmental Noise Control Manual* was not to be used. As noted above there was no replacement for the EPA Helicopter Noise Guideline contained in the *Environmental Noise Control Manual*.

Councils and residents, if relying upon previous Land & Environment Court judgments, would be unaware of the changes to the noise criteria/assessments for helicopter landing sites and may well assume there is a requirement under EPA/DECCW criteria for noise testing/assessment of helicopter flight paths under the EPA Helicopter Noise Guideline – even though the *Environmental Noise Control Manual* was discontinued in 2000.

The EPA has not released a replacement helicopter noise guideline, nor published any technical update or application note about helicopter noise criteria.

The Environmental Noise Control Manual has been superseded and the EPA has not issued any replacement criteria specifically for helicopter noise assessments. The EPA Helicopter Noise Guideline is not therefore applicable to the subject helipad.

4.2 Australian Standard AS 2363

In 1990 Australian Standard AS 2363-1990 *Acoustics – Assessment of noise from helicopter landing sites* was published. The Standard formalised measurement and analysis procedures and excluded ambient noise in the determination of the helicopter noise level to address the technical error in the EPA Helicopter Noise Guideline.

Appendix A of AS 2363-1990 provided acceptability criteria for 12-hour periods. The acceptability criteria were provided by the Civil Aviation Authority (now AirServices Australia) and were based on the ANEF system used for the assessment of aircraft noise in Australia (established under AS2021).

The Standard defined the method of energy averaging the results of the individual flight path movements. The Standard nominated the use of FAST response for helicopter measurements (instead of SLOW response used for the ANEF procedures) to account for the subjective characteristics of helicopter noise.

Joint testing of helicopter operations undertaken by the Principal of The Acoustic Group and the EPA (for the Standards committee) identified a significant difference between the FAST and SLOW response could occur in varying wind conditions for various flight modes. The joint testing also confirmed issues with the SPCC/EPA calculation set out in Chapter 212 of the EPA's Environmental Noise Control Manual.

The ANEF system is based upon aircraft movements over 24 hours for an average day. For ANEF 20 (the threshold of acceptability for aircraft noise exposure) the equivalent Leq level has been taken as 55 dB(A) Leq. The ANEF formulae has a different weighting for the night time period when one aircraft movement at night is taken calculated as equivalent to four daytime movements.

The majority of helipads operate in daylight hours. As a result of normal operations AirServices Australia proposed for the helicopter standard AS2363 different Leq limits in the day versus the night for residential receivers.

Appendix A of the Standard AS 2363-1990 noted that, while acceptability criteria were recommended, the provision of actual noise limits was the responsibility of the relevant statutory authority.

Table A1 of the Standard AS2363-1990 is reproduced below.

RECOMMENDED ACCEPTABLILITYCRITERIA FOR 12-HOUR PERIODS

Usage of premises and zoning	$L_{Aeq,T}$ (Hel)		L_{Amax} (Hel) (see Note 3)	
	Daytime	Nightime	Daytime	Nightime
Residential and hospital areas	60 (see Note 2)	50 (see Note 2)	85	80
Commercial areas	65	65	95	90
Other areas (churches, schools, theatres, etc.)	60	60	90	90

NOTES:

1. This Standard makes no recommendation on limits in industrial areas
2. For these area classifications, $L_{Aeq,T}$ (Amb) + 10 dB(A) can be used instead of $L_{Aeq,T}$ (Hel) if the former is lower
3. Special consideration may be given to the operation of aerial ambulances. For this reason, $L_{Aeq,T}$ (Hel) either night or day, must be satisfied, but L_{Amax} (Hel) is not specified for aerial ambulances.
4. In the absence of further information, daytime is understood to be between 0700 hours and 1900 hours and nightime between 1900 hours and 0700 hours.
5. If the existing ambient level exceeds the L_{Aeq} level specified in the table, the introduction of helicopter operations should not raise the level by more than 2 dB(A).

The ANEF index is just aircraft noise and does not include ambient in the formula or consider the aircraft noise relative to the ambient noise level.

Note 2 to the above table was introduced into the Standard by the NSW EPA to account for the use of a 60 dB(A)/50 dB(A) Leq limit for residential locations in quiet areas could create an unacceptable impact.

The use of ambient Leq + 10 dB(A) would in quiet areas provide a lower Leq limit than the base limit set out in Table A1 of AS2363-1990 and is appropriate in quiet areas.

In 1999 the second version of AS2363 was issued. It incorporated minor amendments to the assessment procedure and excluded the recommended acceptability levels in Appendix A. Section 6 of the second version (1999) of Standard AS 2363 required the assessment to be compared with criteria set by the relevant statutory authority.

In the absence of EPA noise criteria to replace the EPA Helicopter Noise Guideline, the most relevant criteria are the AirServices Australia 20 ANEF criteria (equivalent to an Leq, 24 hr 55 dB(A)), derived from AS2021.

Although the criteria in Table A1 of 2363-1990 are no longer current, the table can be used to supplement an analysis against the ANEF 20 criteria and to confirm the acceptability of noise impacts. In particular, the criteria can be used to identify the relevant target criteria in quieter areas.

4.3 Commission of Inquiry into Sydney CBD Heliport at Pyrmont Pier 8

The EIS for the Sydney CBD Heliport evaluated the proposed operations in terms of the EPA Helicopter Noise Guideline (with corrections) and AS2636-1990.

Following exhibition of the Sydney Heliport EIS and recommendation for approval, a Commission of Inquiry was held into the proposed Pier 8 Heliport.

A submission from the NSW Department of Transport (to the Commission of Inquiry) contained in Appendix C, the following brief statement from the Civil Aviation Authority (Acting General Manager, R & D and ICAO Division):

> *The CAA is represented on the Standards Australia committee AV/11 Acoustics – aircraft and helicopter noise, and supports the use of Australian Standard AS 2363-1990.*

Objector submissions about the heliport cited the use of the EPA Helicopter Noise Guideline.

In the Report from the Commission of Inquiry (1993) into the Sydney CBD Heliport, the Commissioner (with the technical assistance of an acoustical engineer Mr. D. Craig) was critical of the SPCC guideline (because of the problem with the formula described above) and applied an assessment criterion for residential receivers based on a helicopter contribution (in the air) of 20 ANEF (referenced back to the Australian Standard for aircraft noise AS2021). The report from the Commission of Inquiry adopted the general conversion of ANEF + 35 = LAeq 55 dB.

The benefit of the Commission of Inquiry report is an acknowledgment by the EPA that the EPA Helicopter Noise Guideline contained errors, the ANEF was the appropriate noise target, and that AirServices Australia endorsed the use of ANEF 20 (or equivalent in LAeq) for helicopters.

4.4 EPA 2004 Advice

In 2004, the EPA provided verbal advice to The Acoustic Group that it had received further legal opinion confirming the EPA did not have authority to control noise from helicopters, except when the helicopter was on the ground.

The 2004 verbal advice came as a result of completion of an annual acoustic compliance test required for a helipad at Australia's Wonderland (near Blacktown). The compliance testing was conducted in accordance with the conditions M8.2, L6.1 and L6.2 on EPA Environment Protection Licence 11509. Subsequent verbal advice from the EPA was that the Licence had been changed to only require noise assessment for operation of the helicopter on the ground. We conducted the compliance test and were advised by Australia's Wonderland that no notification of the change in compliance testing requirements had been provided to Australia's Wonderland.

The EPA advised The Acoustic Group in 2004 that only the noise component of the helicopter whilst on the ground was to be assessed in accordance with the EPA's *Industrial Noise Policy ("INP").* The EPA advised that the moment the helicopter skids (or wheels) are off the ground then the noise generated by the helicopter falls under the control of AirServices Australia.

The INP presents two acoustic criteria, the intrusive noise target and the amenity noise target.

The "intrusive noise target" which assesses noise from the helicopter as an Leq level over a 15-minute period at any residential boundary, or for large properties at the residential boundary or 30 m envelope from the residence, whichever is closer to that residence.

The amenity noise target is the cumulative ground noise component measured/assessed over the entire daytime period of 7AM to 6PM, the evening period of 6PM to 10PM, and the night time period of 10PM to 7AM.

For the ground component of a helipad the intrusive noise target would be the target of concern.

In 2005, the EPA confirmed its advice about assessing the ground component only. This was one of the requirements of the Department of Environment and Conservation (DEC) for a proposal at Capertee to operate helicopter joy flights over the Capertee Valley.

An acoustic assessment report for the Capertee helipad was prepared by PKA Acoustic Consulting (ref 205 042 R01, dated March 2005). Page 4 sets out the following as one of the DEC requirements:

Noise Assessment for Ground Operations at Aircraft (Helicopter) Facilities

The assessment is for ground operations only. Air Services Australia should be consulted for airborne operational noise requirements. The assessment comprises three components, each of which should be assessed for relevant residential receivers.

- *The measured or predicted L_{Aeq}, 15min from typical worst-case ground operation shall be assessed against criteria derived from the Rating Background Noise Level (RBL) at relevant receiver locations plus 5 dB(A).*

  Notes: RBL is defined in the NSW Government Industrial Noise Policy, Ground operations include the activities outlined in the Protection of the Environment Operations Act 1997, Schedule 1 definition of Aircraft (Helicopter) Facilities. DEC notes that typical worst case ground operations may include engine start-up, warmup, takeoff and landing operations for short duration flights.
- *The measured or predicted L_{Aeq}, period (considering the operating period of the helipad) from ground operation shall be assessed against the acceptable noise levels in Table 2.1 of the NSW Government Industrial*

Noise Policy at relevant receiver locations. The assessment periods are those defined for day, evening and night (as relevant to the proposed operating hours of operation of the facility) within the NSW Government Industrial Noise Policy. Where operations are proposed for only part of an assessment period, the period of actual operation shall be assessed against the acceptable noise level for the period.

- *Where exceedance of either component of the assessment criteria is noted, an assessment of feasible and reasonable mitigation options shall be presented.*

The acoustic report from PKA Acoustic Consulting for the Capertee heliport did not provide a copy of the DEC (EPA) correspondence.

The report of Lithgow Council's Group Manager Regional Services for DA 319/06 about the operation of the heliport at Capertee is dated 4 June 2007. An extract of the report is provided in Appendix G. Page 17 of the extract identifies it was a requirement of the development application for the assessment consist of noise emissions resulting from all ground operations of a helicopter operating at the site.

Page 24 of the Officer's report under heading of "Department of Environment and Conservation (Environmental Protection Unit)" states:

The General Terms of approval issued by the DEC are attached as part of Schedule 1 of the recommendations.

In their correspondence the DEC indicated that in assessing the proposal and reviewing the public submissions, as with the first Development Application (DA 22–05) the EPA again identify the potential impact of noise on the amenity of residents of the Capertee Valley and the surrounding areas as an important issue. Lithgow City Council should consider the issue in its overall assessment of the application. The noise from helicopters in flight is outside the control of the EPA; nevertheless, it is apparent from the public submissions the noise from helicopters in the air is the overwhelming impact of concern for people who made submissions objecting to the proposed development.

Appendix G includes a copy of Schedule 1 referred to in the officer's report. In condition L6.1 there are noise limits specified by the DEC, being the intrusive noise target of background +5 dB(A) and the amenity noise target derived from the EPA's INP document for three residential receivers.

Condition L6.1 does not specify that the noise limits are restricted to ground operations. Condition L6.6 (still being part of the noise limits), however, clearly refers to ground operations.

Condition L6.6 identifies the requirement for a noise management plan that addresses noise impacts from the heliport ground operations.

The officer's report and the DEC (EPA) conditions provided in Appendix G indicate that the Council and the EPA accepted:

- The EPA did not have control over noise from the helicopter when airborne, and
- It was appropriate to apply the INP for on ground noise.

The Capertee heliport proposal subsequently came before the Land & Environment Court in *Mark Lilley – v- Council for the City of Lithgow* (Proceeding No. 10390 of 2007). The Acoustic Group were retained by the Applicant in those proceedings.

Ground noise from the helicopter operations was not an issue in that case by reason of compliance with the DEC's General Terms of Approval. The acoustic issue before the Senior Commissioner related to the airborne noise component.

4.5 Environment Principles and Procedures for Minimising the Impact of Aircraft Noise

The Acoustic Group raised the issue of the OEH/DECC/DECCW/EPA noise criteria for helicopter noise when it acted for the Applicant in *Mark Lilley – v- Council for the City of Lithgow*.

As a result of the EPA's advice that it was not concerned with noise from the helicopter when airborne, The Acoustic Group presented the following position to the Court:

- AS 2363-1999 did not recommended acoustic criteria (compared to the 1990 version),
- The NSW EPA did not have any airborne noise criteria,
- AirServices used the ANEF system for assessment of aircraft noise, and
- AirServices Australia had issued a planning document "*Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise*" ("ASA Environmental Principles"),

- The proposed helicopter joy flights would occur over the Capertee National Park, being locations removed from the main highway.

In the Lilley matter the proposal was to provide a helipad at Capertee that was for the specific purpose of providing scenic flights over the Capertee National Park. At the time of the proposal there were no such operations.

There is a total of 12 Principles provided in the ASA Environmental Principles for the design of flight paths and operational procedures that may be adopted to minimise noise.

Part A of the document provides a summary of the Principles as follows:

FUNDAMENTAL PRINCIPLES

The following fundamental principles are to be used in environmental assessments (of proposals for new air routes and for changes to existing arrangements) and as a basis for selecting preferred noise abatement procedures.

Total Noise Dose

Principle 1: Noise abatement procedures should be optimised to achieve the lowest possible overall impact on the community.

Spatial Distribution of the Noise Dose

Principle 2: Noise should be concentrated as much as possible over non-residential areas.

Principle 3: Noise exposure should be fairly shared wherever possible.

Principle 4: No suburb, group or individual can demand or expect to be exempt from aircraft noise exposure.

Upper and Lower Limits of Noise Exposure

Principle 5: Noise is not considered significant when selecting noise preferred options if exposure amounts to less than 40 $LAeq_{24}$ and there are less than 50 overflights per day.

Principle 6: No residential area should receive more than 60 $LAeq_{24}$, i.e., no residential area should receive more noise exposure than that which is considered "unacceptable" for residential housing under Australian Standard AS 2021.

Principle 7: There should be a current agreed aircraft noise exposure level above which no person should be exposed, and agreement that this level should be progressively reduced. The goal should be 95 dB(A).

Timing/ Historical Issues

Principle 8: When comparing options, operations that are conducted at night or on weekends should be treated as being more sensitive than those which occur during the daytime or on weekdays.

Principle 9: Both short-term and long-term noise exposure should be taken into account in deciding between options.

Principle 10: Options which allow for a gradual change from the current plan procedures should be given preference.

Principle 11: In deciding between mutually exclusive, but otherwise equivalent options, involving

(i) the overflight of an area which has previously been exposed to aircraft noise for a considerable period of time (and which a large proportion of residents would therefore have been aware of the noise before moving in); or

(ii) a newly exposed area,

option (i) should be chosen.

Reciprocal Flight Paths

Principle 12: To the extent practicable, residential areas overflown by aircraft arriving on a particular runway should not also be overflown by aircraft departing from the runway in the reciprocal direction.

In the Lilley matter it was agreed between the acoustic experts that airborne helicopter operations giving rise to a contribution not exceeding 40 dB(A) would, for quiet areas in a National Park removed from the highway, not generate a significant disturbance. In the Lilley decision the Senior Commissioner chose a 40 dB(A) $L_{eq,\ 24\ hr}$ criterion to apply for the National Park (Principle 5). It is noted that the ambient Leq levels in the Park were taken to be 30 dB(A) and that the 40 dB(A) criteria applied by the Senior Commissioner conforms to Note 2 in Table A1 of AS2363-1990 (ambient levels plus 10dB(A)).

However, the ambient Leq noise levels in proximity to the subject helipad are not less than 30 dB(A). The acoustic environment of Bardens Bay cannot be equated to Capertee National Park. For this reason alone, Principle 5 of the ASA Environmental Principles is not relevant to and should not be applied in the assessment of the subject helipad.

Further, it is noted that the ASA Environmental Principles could not be found on the AirServices Australia website and there is no indication on the website about the current status of that document. The Acoustic Group has now been advised by AirServices Australia that the ASA Environmental Principles are no longer used by AirServices Australia. For helicopter noise the AirServices Australia website refers to fly neighbourly agreements and not any specific acoustic criteria.

In any event, the assessment and design of the subject helipad complies with Principles 1, 2, 3 and 4 of the ASA Environmental Principles. Principle 5 is expressed as a threshold level, under which noise levels will be deemed not to be significant (provided there are less than 50 movements a day). It does not specify an acceptability target (as per Principle 6). In that sense, it is only relevant where noise levels are less than the 40 $LAeq_{24}$ and where levels are higher than that, a proper assessment of impact would need to be undertaken to determine whether the noise impacts will be acceptable. In this case, Principle 5 is not relevant, but the criteria in Principles 6 and 7 should be considered. Section 5.3 of this report address the compliance of the proposal with the ASA Environmental Principles.

The result of the testing has led to the application having less than 50 overflights per day (Principle 5), and less than the acoustic criteria set out in Principle 5 & 6. These concepts automatically occur from the application of Part C of the ASA Environmental Principles that governs helicopter operations and identifies procedures to be adopted where possible.

For the subject helipad, the proposed flight tracks to the south do not overfly residential areas (procedure 1) below cruise altitude of 1000ft that is permitted by air navigation procedures over the subject area (Part C of the ASA Environmental Principles).
The northerly flight path does overfly residential properties at the northern end of Bardens Bay when in the landing phase. The application nominated a maximum of 8 movements per day if all flights on a day utilised approaches from the north.

The flight tracks that have been nominated for the helipad do not involve circling over residential areas, adopt fly neighbourly procedures, and the use of the nominated flight paths is specified in the management of the operation of the helipad (Part C of the ASA Environmental Principles).

In light of the advice from AirServices Australia that the ASA Environmental Principles are no longer used and in the absence of written clarification as to whether the Principles still apply, The Acoustic Group considers that the most relevant criterion is the ANEF 20. Other current documentation provided by AirServices Australia provides that helicopter operations whilst in the air operate under the Aircraft Noise Exposure system (ANEF-Aircraft Noise Exposure Forecast) which predicts noise levels over a one-year average.

4.6 Current EPA Criteria

Under the *Protection of the Environment Operations Act ("POEO Act")* helicopter-related activities are declared to be Premises-based activities that are identified as "Scheduled Premises".

In Schedule 1 of the POEO Act "helicopters-related activities" are defined as:

> *meaning the landing, taking off or parking of helicopters (including the use of terminals and the use of buildings for the parking, servicing or maintenance of helicopters), being an activity:*
>
> *(a) that has an intended use of more than 30 flight movements per week (where take-off and landing are separate flight movements), and*

> *(b) that is conducted within 1 kilometre of a dwelling not associated with the landing, taking-off or parking of helicopters,*
>
> *but not including an activity that is carried out exclusively for the purposes of emergency aeromedical evacuation, retrieval or rescue.*

Schedule 1 does not define what constitutes "landing", "taking off" or "parking" of a helicopter. Hovering is part of the landing and take-off procedure, whilst parking can involve flying the helicopter (in a hover) to a particular parking spot. The operation of a helicopter whilst on the ground prior to or after a flight is not defined in the Schedule.

Chapter 1 of the EPA's *Noise Guide for Local Government* provides a table identifying the responsibility for different types of noise sources that may occur in New South Wales (separately from aircraft operations that may occur on Commonwealth airports). The *Noise Guide for Local Government* states on page 1.18 that for "helicopter premises not covered by the POEO Act Schedule 1 - e.g. aircraft on the ground undergoing excessively noisy engine maintenance" the responsibility for noise from the ground component of helicopters lies with the Council (being the Appropriate Regulatory Authority under the POEO Act). The EPA is the Appropriate Regulatory Authority for such activities covered by the POEO Act Schedule.

We are instructed there will be no engine maintenance or servicing carried out at Trinity Point Marina helipad.

Page 1.18 of the EPA's *Noise Guide for Local Government* under the "Comments" column for all helicopter premises (covered by the POEO Act or otherwise) states:

> *Air Services Australia is responsible for noise from aircraft in flight and aircraft movements (taxiing, taking off and landing). The POEO Act provisions cannot be applied to these activities. This includes conditions specifying, for example:*
>
> - *noise limits that apply to aircraft in flight and aircraft movements*
> - *permitted hours for movements, permitted number of movements*
> - *(except in limited circumstances) permitted aircraft models – e.g. models certified to meet a certain noise level in certain specified test conditions.*

Excluding the above operations that are governed by AirServices Australia, the only helicopter noise component that could fall under the responsibility of Council or the EPA relates to the period of time when the helicopter is stationary on the ground at the final shutdown/start up location. Arguably, the Council or the EPA may not be responsible for that startup / shutdown noise either, because it forms part of the flight movement. Under operational procedures, the starting of the engine of a helicopter in aviation terms becomes part of the flight, as does the time until the engine is shut down, i.e. the pilot in logging their hours total the engine operating hours in their log book.

If that is the case, the Council and the EPA would only have responsibility for noise impacts from engine maintenance or other ground activities ancillary to the helicopter flights, but not helicopter engines. The *Noise Guide for Local Government* indicates that the Industrial Noise Policy will be relevant to an assessment of those impacts. This position is consistent with the most recent verbal advice received by The Acoustic Group from the EPA.

As noted above in *Mark Lilley – v- Council for the City of Lithgow* the (then) DECC confirmed (for the preparation of the acoustic report to accompany the DA) that the ENCM guideline for helicopters did not apply. The DECC specified for the helipad application the standard *intrusive noise* criteria from their *Industrial Noise Policy* document.

Consequently, it would appear that for helicopter operations when on the helipad the relevant criteria are the intrusive goal (for individual movements), and the amenity goal (for the total number of movements in a day whilst on the helipad), derived from the *Industrial Noise Policy*.

However, in 2015 The Acoustic Group sought to resolve some ambiguity about the Schedule to the POEO Act concerning emergency helicopter operations when dealing with an application for the proposed Westpac Rescue Helicopter Operations at Lake Macquarie airport. We were advised by the EPA that it had received further (unpublished) "legal opinion" confirming that if a helicopter was on the ground and had the engine running that was part of the flight component and as such fell under the control of AirServices Australia.

If this is the case, then the INP noise criteria will not apply to on-ground helicopter noise. The noise criteria applying to airborne noise (ANEF 20 based on AS2021 or other as determined by authorities) should then be applied to the helicopter noise from the time the engine starts or shuts down relative to the movement(s) in question.

Consistent with the most recent verbal advice received from the EPA, this assessment proceeds on the basis that noise from helicopters whilst in the air or on the ground is not controlled by the EPA or Council. Any noise emission from helicopters idling or powering up whilst on the ground is part of the airborne component and therefore falls under the control of AirServices Australia.

Based on its significant experience with helicopter and aircraft noise assessments, knowledge of the various criteria that have been applied in the past, and its understanding of aviation operational procedures, The Acoustic Group considers that it is appropriate to follow the EPA's most recent verbal advice. That is, The Acoustic Group agrees that the relevant criteria for the assessment of helicopter noise including any on ground component is ANEF 20 and the *Industrial Noise Policy* does not apply to helicopter engine noise, even when it is on the ground.

After further consultation with the Department concerning the subject proposal it has been suggested that whilst the ASA Environmental Principles are no longer used by AirServices Australia they should be a reference document for assessment purposes and supplemented by the HAI Fly Neighborly Guide, cited by AirServices Australia as a noise abatement concept.

4.7 Orange East Heliport

In the intervening period between the issue of the acoustic assessment report for the proposed helipad at the Trinity Point Development and this amended report the Chief Judge of the Land & Environment Court of NSW has issued a Judgment in relation to the helipad at the Highland Heritage Estate becoming the Orange East Heliport with the capacity for a greater number of movements than nominated for the Trinity Point Development.

The Judgment from the Chief Judge as Nessdee Pty Limited v Orange City Council [2017] NSWLEC 158 addresses the acoustic issues/criteria commencing at paragraph 19 of the Judgment. The judgment confirms the use of ANEF 20 with the nominal conversion of 35 to an LAeq over a 24 hour period was accepted by the tow acoustic experts in that matter.

It is noted that the assessment for the Orange East Heliport followed the same procedure as set out in the original and this amended acoustic report, with the testing being witnessed by Council officers and an acoustic expert retained by the Council.

The analysis and calculations relating to the helicopter testing was view by both experts. Whilst all the test flights were recorded simultaneously at multiple locations by The Acoustic Group, both experts attended each of the monitoring locations during the tests and jointly conducted their own supplementary monitoring.

The monitoring assessed multiple flight paths and the various permutations in the use of those paths, dependent upon the wind direction and strength.

The acoustic assessment report and the joint reports of the acoustic experts identified limitations in flight numbers/paths/helicopters in a similar manner as set out in this report.

In relation to acoustic criteria that were assessed in the original acoustic assessment for the helipad at the Trinity Point Development, some of those criteria would in terms of the Chief judge's decision in the Orange East Heliport matter be redundant. However, for consistency with the previous version of this report that material is still provided.

4.8 Noise Criteria for Helicopters

ASA Environmental Principles

Under the suggestion that reference should be made to the ASA document *Environmental Principles and Procedures for Minimising the Impact of Aircraft Noise* (which was referred to by the Court in the Lilley matter), whilst the design has already addressed Principles 1, 2, 3 and 4, then for acoustic purposes Principles 6 and 7 would apply:

> *Principle 6:* *No residential area should receive more than 60 LAeq $_{24}$, i.e., no residential area should receive more noise exposure than that which is considered "unacceptable" for residential housing under Australian Standard AS 2021.*
>
> *Principle 7:* *There should be a current agreed aircraft noise exposure level above which no person should be exposed, and agreement that this level should be progressively reduced. The goal should be 95 dB(A).*

Principle 6 provided the direct link to the ANEF system under AS2021 and confirmation of a 35 dB(A) adjustment. The unacceptable limit for residential receivers in AS2021 is ANEF 25, giving rise to ANEF 25 + 35 = LAeq $_{24}$ value of 60dB.

AS2021 provided the upper limit of acceptable aircraft noise at ANEF 20. Therefore, ANEF 20 + 35 = LAeq $_{24}$ value of 55dB.

Given the relevance of AS2021 the following criteria from the ASA Environmental Principles document should apply:

> *Noise emission from the helicopter when taking off or landing, and including operations whilst on the helipad arising from the start up, idle, power up and (in reverse) until shutdown are not to exceed an unacceptable level of aircraft noise impact of 60 dB LAeq$_{24}$, and in the circumstances of the acoustic environment of Bardens Bay, should have a noise objective of less the 55 dB LAeq$_{24}$.*

Reference to the HAI Fly Neigborly Guide provides planning and operational concepts for helicopter operations but no noise criteria. The guide was prepared by the Fly Neighbourly Committee of the Helicopter Association International (with technical assistance of the HAI Acoustics Committee).

In the absence of any specific direction as to noise criteria applicable to the airborne component of the subject helipad, under the due diligence requirement for the project The Acoustic Group are of the opinion there are a number of criteria that have been used in the past and should be identified.

EPA Criteria

There are no longer any EPA criteria for the airborne or ground components of helicopter operations.

Acceptability Criteria (AS 2363-1990)

Australian Standard AS2363 *Acoustics – Measurement of noise from helicopter operations* sets out the methodology for the measurements and analysis of helicopter noise. Whereas the 1990 version of the Standard included noise criteria, the 1999 version of the Standard does not. If the subject helipad is assessed in accordance with AS2363-1990, then from AS2363-1990 the following criteria would apply:

> *Noise emission from the helicopter when taking off or landing, and including operations whilst on the helipad arising from the start up, idle, power up and (in reverse) until shutdown are to comply with the 12 hour Leq levels and*

corresponding maximum levels identified in Table A1 (including note 2) and assessed in accordance with the procedures set out in AS2363-1990.

Table A1 of AS2363-1990 provides residential Leq targets of 60 dB(A) and 50 dB(A) over the 12 hour periods of 7AM - 7 PM, and 7PM and 7AM respectively.

Note 2 to Table A1 in AS2363 provides that for residential dwellings in low ambient areas $L_{Aeq,T\ (Amb)}$ + 10 dB(A) can be used instead of $L_{Aeq,T\ (Hel)}$, if the $L_{Aeq,T\ (Amb)}$ + 10 dB(A) is lower that the $L_{Aeq,T\ (Hel)}$ criterion.

From Table 1 (on page 6 of this report) the daytime ambient Leq levels are less than 50 dB(A), whilst the evening ambient Leq levels are over 40 dB(A). The ambient Leq + 10 dB criterion (Note 2 to Table A1 of AS2363-1990) applies for the day, but not for the period of 7 PM to 10 PM).

The existing ambient Leq levels are below the targets provided in AS 2363-1990. Therefore, Note 5 to Table A1 of AS2363-1990 does not apply.

Based on Note 2 to Table A1 of AS2363-1990, the following helicopter noise contribution targets have been allocated for the subject helipad (for the purposes of assessing compliance with the 12 hour Leq levels under AS2363-1990).

For the monitoring locations used in the study the results of the three logger locations have been assigned to the other monitoring locations as shown in Table 2.

TABLE 2: AS2363-1990 Helicopter Noise Targets

Logger/Residential Locations	$L_{Aeq,T}$ (Hel)		L_{Amax} (Hel) (see Note 3)	
	Daytime	Nightime	Daytime	Nightime
1, 7	55	50	85	80
2	59	50	85	80
3,4,5, 6	56	50	85	80

ANEF 20 (AS 2021)

AirServices Australia have provided verbal advice to the Acoustic Group that the ANEF is the acoustic index to be used for assessment purposes. Page 17 outlined the basis of the ANEF parameter.

The ANEF is a noise contribution and does not include ambient noise in the assessment process. There is no allowance or consideration of the ANEF value relative to the ambient noise.

The Acoustic Group consider that in assessing the noise impact of helicopter operations that the approach from AS2363-1990 dealing with the low noise acoustic environments should also be applied to the subject application, with consideration also given to ASA Principles 6 & 7.

In dealing with the ANEF 20 criteria, identified by AirServices Australia as their current noise targets, from the previous discussion the following airborne noise criteria is proposed for the subject helipad:

> *Noise emission from the helicopter when taking off or landing, and including operations whilst on the helipad arising from the start up, idle, power up and (in reverse) until shutdown are to comply with an ANEF 20/$L_{(Aeq,24hr)}$ 55 dB(A) when assessed in accordance with the procedures set out in AS2363-1990.*

AS2363 requires measurements recorded using the A-weighted parameter not the Effective Perceived Noise Level (EPNL). The AirServices Australia correction of +35 dB to the ANEF is required to determine the ANEF from the calculated LAeq results.

Conclusion

As a result of the above analysis of the most appropriate criteria for the acoustical assessment should be in terms of the AirServices Australia ANEF 20 criterion ($LAeq_{24}$ 55 dB). This agrees with the Orange East Heliport Judgment.

In addition, as a precautionary measure the helicopter operation can be assessed against the criteria set out in AS2363-1990and ASA Environmental Procedures. This, in our view, results in a more conservative and very comprehensive assessment of the potential noise impacts.

APPENDIX D: Orange East Heliport Judgment

Land and Environment Court
New South Wales

Medium Neutral Citation:	**Nessdee Pty Limited v Orange City Council [2017] NSWLEC 158**
Hearing dates:	15–18 August, 3 and 6–7 November 2017
Date of orders:	28 November 2017
Decision date:	28 November 2017
Jurisdiction:	Class 1
Before:	Preston CJ
Decision:	The Court orders: (1) The applicant is to prepare, file and serve a Plan of Management for Orange East Airport, a Stormwater Management Report for the Proposed Heliport and any further plans by 8 December 2017. (2) The parties are to confer and agree on the conditions of consent (revised in accordance with the Court's rulings) by 13 December 2017 and file the revised conditions by 14 December 2017. (3) The proceedings are listed on 19 December 2017 at 9:30am for further hearing and disposal of the proceedings.
Catchwords:	APPEAL – heliport – acoustic impacts of helicopter operations – proposal amended to confine helicopter operations and reduce acoustic impacts – amended proposal will comply with accepted numeric noise criteria – whether still unacceptable acoustic impacts on residential amenity and aesthetic values of locality – whether acoustic impacts unacceptable because of availability of alternative site at nearby airport – visual impacts of helicopter operations – whether unacceptable visual impact on aesthetic values of locality – environmental impact statement for designated development of heliport – adequacy of EIS consideration of need and justification for heliport and alternative sites – public interest – whether public interest favours refusal – development consent should be granted on conditions – conditions to be settled
Legislation Cited:	Environmental Planning and Assessment Act 1979 ss 77A(1), 78A(8)(a), 97, 97A Environmental Planning and Assessment Regulation 2000 Sch 2 cl 3(8), 7, Sch 3 cl 2(b)

	Orange Local Environmental Plan 2011 cll 2.3(2)
Cases Cited:	BGP Properties Pty Ltd v Lake Macquarie City Council (2004) 138 LGERA 237; [2004] NSWLEC 399 Helman v Byron Shire Council (1995) 87 LGERA 349 Lilley v Lithgow City Council [2007] NSWLEC 608
Category:	Principal judgment
Parties:	Nessdee Pty Limited (Applicant) Orange City Council (First Respondent) Mr Gavin Alston (Second Respondent) Ms Esme Alston (Third Respondent)
Representation:	Counsel: Mr C McEwen SC and Mr M Staunton (Applicant) Mr P Clay SC and Ms J Reid (First Respondent) Ms B Scott as Agent for the Second and Third Respondents Solicitors: Cheney Suthers Lawyers (Applicant) Crennan Legal Pty Ltd (First Respondent)
File Number(s):	2017/70619
Publication restriction:	Nil

JUDGMENT

A new heliport is proposed

1 Fredericks Valley is south of the City of Orange and runs alongside the Mitchell Highway. At Highland Heritage Estate, one of the properties adjacent to the highway and backing onto Summer Hill Creek, Nessdee Pty Ltd ("Nessdee") operates a helicopter landing site following the grant of development consent for seven flight movements a week. Nessdee now seeks development consent for the operation of a heliport with up to 90 flight movements each week. Orange City Council ("the Council") refused consent. Pursuant to s 97 of the *Environmental Planning and Assessment Act 1979* ("the EPA Act"), Nessdee appeals against the Council's decision.

2 In addition to helicopter flights, the proposed development includes classroom based pilot training and pilot accommodation. It seeks to utilise infrastructure that has been constructed as part of the existing helicopter landing site, including the hanger, the awning and apron, some of which includes works undertaken without development consent. The development, if approved, would consent to the future use of these unlawfully constructed structures.

3 The proposed development is designated development under s 77A(1) of the EPA Act and cl 2(b) of Sch 3 of the *Environmental Planning and Assessment Regulation 2000* ("the EPA Regulation").

4 The Council opposed the grant of development consent on the basis that the heliport will have an unacceptable impact on the locality by reason of the acoustic and visual impacts that cannot be suitably ameliorated by conditions of consent. Further, the Council contended that the proposed heliport, being designated development, is not justified having regard to the impacts on the locality and the availability of similar services at Orange Airport, about 7 kilometres from the subject site.

5 Because the proposed heliport is designated development, s 97A of the EPA Act allows any objector to be heard at the hearing of the appeal as if the person or body was a party to the appeal, as long as the objector applies to be heard within the requisite time. Two objectors, Mr and Mrs Alston, applied to and were joined as the second and third respondents to the appeal. The Court granted leave to Ms Scott, who is the daughter of Mr and Mrs Alston and an architect, to appear as their agent on the hearing of the appeal. Mr and Mrs Alston did not file a statement of facts and contentions but objected to the proposed heliport on the grounds of its acoustic and visual impacts in a locality valued for its serenity, the incompatibility of the heliport with the rural character of the area, concerns about the regulation of flights after take-off and enforcement of conditions of consent, concerns regarding the safety of the heliport operations, and the impact of the proposal on the heritage significance of the nearby heritage house known as "Wellwood".

Outcome of the appeal

6 The proposal for the heliport was amended during the hearing, including specifying the flight paths and alternative landing sites to be used in different weather and wind conditions. There has also been extensive acoustic testing of helicopters using these amended flight paths and landing sites. Stringent measures have been proposed to mitigate the impacts of carrying out the amended proposal.

7 With these amendments to the proposal and mitigation measures, I find that the proposed heliport will not cause unacceptable impacts, including acoustic and visual impacts, on the locality. The acoustic impacts can be satisfactorily addressed by the imposition of appropriate conditions of consent and the further merit issues raised by the objectors have been satisfactorily addressed.

8 I have also determined that the Council's contention that the proposed heliport warrants refusal because its impacts could be avoided due to the availability of Orange Airport should be rejected. The proposed heliport is permissible with consent in the relevant E3 Environmental Management Zone under Orange Local Environmental Plan 2011 ("Orange LEP"). The Council's strategic planning does not require all air transport facilities, including heliports, to be located at Orange Airport, but rather permits such facilities to be carried out across a large part of the Local Government Area, provided they have acceptable impacts. I find this is the case with the proposed heliport.

9 I have determined, therefore, that Nessdee's appeal should be upheld and that development consent for the proposed heliport should be granted on conditions. Certain documentation (including management plans) and the conditions of consent will need to be revised. I will direct this to be done and a further hearing fixed to make the orders granting consent.

10 I gratefully acknowledge the assistance of Commissioner Gray in the hearing of the proceedings, under s 37(1) of the *Land and Environment Court Act 1979*.

The planning framework

11 The land on which the heliport is proposed is within the E3 Environmental Management Zone under Orange LEP. The E3 zone extends over a large area of Orange City, including all of the land to the south of Orange along the Mitchell Highway and the land surrounding Orange Airport. The objectives of the E3 zone are:

> "• To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.
>
> • To provide for a limited range of development that does not have an adverse effect on those values.
>
> • To manage development within water supply catchment lands to conserve and enhance the city and district's water resources.
>
> • To maintain the rural function and primary production values of the area.
>
> • To ensure development along the Southern Link Road has alternative access."

12 The Land Use Table for the E3 zone permits without consent three types of development, none of which are relevant. The types of development permitted with consent include air transport facilities and helipads. The types of development that are prohibited include industries (other than those industries specified as being permitted with consent) and any other development not specified as being permitted without consent or with consent.

13 The development of an "air transport facility" is defined in the Dictionary to Orange LEP to mean "an airport or a heliport that is not part of an airport, and includes associated communication and air traffic control facilities or structures." An "airport" is defined to mean:

> "a place that is used for the landing, taking off, parking, maintenance or repair of aeroplanes, and includes associated buildings, installations, facilities and movement areas and any heliport that is part of the airport."

14 A "heliport" is defined to mean:

> "a place open to the public that is used for the taking off and landing of helicopters, whether or not it includes:
>
> (a) a terminal building, or
>
> (b) facilities for the parking, storage or repair of helicopters."

15 A "helipad" is a distinct development to a "heliport". A "helipad" is defined to mean "a place not open to the public used for the taking off and landing of helicopters."

16 The existing helicopter landing facility would be classified as a helipad under the current definition, as it is not open to the public. The proposed development is for a heliport, which will be open to the public.

17 Clause 2.3(2) of Orange LEP requires the consent authority to "have regard to the objectives for development in a zone when determining a development application in respect of land within the zone."

18 The Council, and Mr and Mrs Alston, relied particularly on the first and second objectives of the zone to contend that the proposed heliport will have an adverse effect

on the aesthetic values of the area of Fredericks Valley. Nessdee disputed that the proposed heliport would have such an adverse effect. Nessdee also relied on the second objective as demonstrating the acceptability of the type of development of air transport facilities, including heliports, in the zone. The second objective is declaratory: the limited range of development that is permitted without or with consent in the Land Use Table is taken to be development that does not have an adverse effect on the values, including the aesthetic values, of the area. That is to say, the limited range of development specified is not inherently incompatible with the objectives of the zone.

The acceptability of the noise impacts

19 The Council and Mr and Mrs Alston contended that the operation of the proposed heliport would have adverse acoustic impacts on the aesthetic values of Fredericks Valley and the amenity of residents of the valley. The acoustic impacts of the proposed heliport have been extensively assessed. As a result of concerns raised by the Council as to the manner of operation of the proposed heliport, including the taking-off and landing of helicopters in different weather and wind conditions, Nessdee amended its proposal. Amongst other aspects of the development, the proposal now defines: the types of helicopters that can use the heliport; the number of helicopter movements (per day and per week); the hours of operation of the heliport, including limiting take-off and landing of helicopters in night time hours; the minimum distance that helicopters must keep clear of identified residences (both vertically and laterally); the flight paths that helicopters must fly in different weather and wind conditions; and the landing sites that must be used in different weather and wind conditions.

20 The parties' aviation experts, Mr Green for Nessdee and Mr Allan for the Council, agreed on the feasibility and acceptability of the amended proposal. The parties' acoustic experts, Mr Cooper for Nessdee and Mr Wasserman for the Council, undertook further acoustic testing of the amended proposal, including measuring the noise of helicopters flying the different flight paths, landing at the different landing sites and undertaking hover taxi manoeuvres. The noise measurements satisfied accepted numeric noise criteria, including the ANEF (Australian Noise Exposure Forecast) criteria for aircraft noise.

21 The parties' acoustic experts accepted the applicability of the ANEF system for determining the acoustic acceptability of helicopter noise around the heliport. The criteria for aircraft noise are set out in Australian Standard AS 2021 Acoustics – Aircraft noise intrusion – Building siting and construction (AS 2021). Mr Cooper explained:

> "AS 2021 utilises a noise exposure system calculated in Australian Noise Exposure Forecast (ANEF) units, that takes into account the following features of aircraft noise:
>
> (a) The intensity, duration, tonal content and spectrum of audible frequencies of the noise of aircraft take offs, approaches to landing, and reverse thrust after landing (for practical reasons, noise generated on the aerodrome from aircraft taxiing and engine running during ground maintenance is not included).
>
> (b) The forecast frequency of aircraft types and movements on the various flight paths, including flights paths used for circuit training.
>
> (c) The average daily distribution of aircraft arrivals and departures in both daytime and night-time (daytime defined as 0700 hours to 1900 hours, and night-time defined as 1900 hours to 0700 hours).

> The ANEF was developed in the early 1980's following a major socio-acoustic investigation undertaken by the National Acoustics Laboratories ("NAL") to assess the impact of aircraft noise on residential communities in Australia. The NAL study led to the development of a dose-response curve to identify the response of the community to the ANEF exposure level leading to an acceptable aircraft noise exposure defined in AS 2021 as being less than ANEF 20, and an unacceptable level of aircraft noise exposure above ANEF 25.
>
> The ANEF system utilises the Effective Perceived Noise Level as the measurement parameter of an aircraft flyover. A general approximation between ANEF and dB(A) Leq is a difference of 35 dB."

22 Notwithstanding that the acoustic experts assessed the noise exposure of residents around the heliport to be less than 20 ANEF (indeed it will be less than 13 ANEF), the Council and Mr and Mrs Alston still contended that the noise from the helicopters using the proposed heliport will still unreasonably impact on the amenity of residents in the surrounding area and the aesthetic values of the valley.

23 I do not agree with this contention. I find that the proposed heliport, as amended and with the mitigation measures that will be taken and required by conditions of consent, will not unreasonably impact on residential amenity or the aesthetic values of the locality. This is because the amendments to the proposal, particularly helicopter operations, and the mitigation measures proposed to be implemented, reduce the acoustic impacts. I find that the residual acoustic impacts will comply with accepted numeric noise criteria and will not have an unacceptable adverse effect on the amenity of residents and the aesthetic values of the locality.

24 I will start with the ways in which the acoustic impacts will be minimised under the amended proposal and the mitigation measures. The noise with which the residents are concerned is the noise from helicopters using the heliport, primarily flying over residences on route to and from the heliport and during take-off and landing.

25 The first way in which noise will be minimised is by specifying, as a condition of consent, the types of helicopters that can use the heliport. This control recognises that different types of helicopters produce different noise (simplistically, the larger and the heavier the helicopter and the larger the engine, the greater the noise). It also recognises that the acoustic assessments that have been undertaken measured the noise from particular types of helicopters. Specification of the types of helicopters ensures that the noise generated by helicopters using the heliport will accord with the acoustic assessments undertaken.

26 The parties agreed that a condition of consent should specify the types of helicopters that are able to use the heliport, but disagreed about the wording. The parties' acoustic experts, Mr Cooper (called by Nessdee) and Mr Wasserman (called by the Council) agreed on a condition (condition 37) stating that:

> "Approved aircraft – Use of the heliport during the daytime period (7am–10pm) shall be limited to single engine helicopters with a maximum take-off weight (MTOW) of 3000kg and having type certification complying with the noise limits under Chapter 11 of ICAO [International Civil Aviation Organisation] Annex 16 [–Environmental Protection] – Refer to condition 46 in relation to night time limits."

27 The specification of helicopters being single engine helicopters, having a maximum take-off weight of 3,000 kilograms, and having type certification complying with the noise limits under Chapter 11 of ICAO Annex 16 – Environmental Protection limits the

noise emissions from helicopters using the heliport.

28 Notwithstanding the agreement of the parties' acoustic experts that this was an appropriate condition, the Council and Mr and Mrs Alston contended that instead the condition should specify the manufacturer and model of the helicopters able to use the heliport. The Council's alternative wording was:

> "Approved aircraft – use of the heliport during the daytime period (7am–10pm) shall be limited to the following types of aircraft – Refer to condition 46 in relation to night time limits
>
> (a) Airbus AS350 (Squirrel 350);
>
> (b) Robinson R66;
>
> (c) Robinson R44 (Raven); and
>
> (d) Robinson R22."

29 I consider that the acoustic experts' condition is preferable to the Council's condition. Each of the types of helicopter specified in the Council's condition would fall within the helicopter descriptions in the acoustic experts' condition. The advantage of the acoustic experts' condition is that it allows those particular helicopters to be replaced in the future by newer helicopters, of the same or different manufacturers and models, which meet or better the desired noise limits. Mr Cooper said in evidence at the hearing that newer helicopters are likely to be quieter than current ones. Replacement of the existing helicopters with newer, quieter helicopters is to be encouraged.

30 The second way in which noise will be minimised is by specifying the number of flights per day and per week. The existing facility, merely being a helipad for private use, is limited to only seven helicopter movements a week. This limit kept the existing development from being designated development (see cl 2(b) of Sch 3 of the EPA Regulation). The proposed development is, however, a heliport open to the public with more helicopter movements. Nessdee proposed setting a limit on helicopter movements of 20 on any day and 90 in any period of 7 days (counted from Sunday to Saturday). A helicopter movement is a take-off or a landing, so that there would be two helicopter movements for a return trip.

31 The acoustic experts assessed the noise from the heliport using these numbers of flights per day and per week. The acoustic experts agreed that all helicopter operations will satisfy both the 20 ANEF (or Leq 55 dB(A) 24 hour) limit (the generally accepted noise criterion for airports) and the lower 13 ANEF (Leq 48 dB(A) 24 hour) limit (the noise criterion suggested for persons newly exposed to aircraft operations).

32 Mr Cooper calculated that there could in fact be more flight movements per day than the 20 specified and still meet both the 20 ANEF and the 13 ANEF criteria. For the most affected residential property, R7, the maximum number of helicopter movements per day, with two flights between 7pm and 10pm (or 11pm for the Robinson helicopter), that could be permitted and not exceed the 20 ANEF and the 13 ANEF criteria would be 25 for both criteria using the heavier and noisier Squirrel helicopter only or 219 and 138 respectively using the lighter and quieter Robinson helicopter only. In practice, both the Squirrel and Robinson helicopters (or equivalent replacement helicopters) would likely be used and hence the maximum number of helicopter movements per day that

could be undertaken and still meet both ANEF criteria would be somewhere between the two data sets.

33 The consequence is that specifying a limit of 20 helicopter movements per day is conservative and will ensure that helicopter noise will be less than both the 20 ANEF and the 13 ANEF criteria.

34 The specification of a further limit of 90 helicopter movements per week introduces an additional limitation on noise emissions. Ninety movements per week is materially less than the 140 movements that would result from 20 movements per day for 7 days. As a consequence, there would be less movements per day on average over a week than 20, which would cause the helicopter noise to be even less than it would be for 20 movements per day.

35 Based on the acoustic experts' evidence, Nessdee proposed a condition fixing the maximum number of flight movements at 20 per day and 90 in any period of 7 days. The Council did not disagree with this condition, if the Court decided to approve the development. The Council still argued that this number of flights would have unacceptable impacts, including on the amenity of residents and the locality (see below). Mr and Mrs Alston, however, disagreed and argued for setting lower limits of 8 flight movements per day and 28 per week.

36 I find that setting the maximum number of helicopter movements at 20 per day and 90 in any period of 7 days will minimise the helicopter noise so as to be well within accepted numeric noise criteria, including the 13 ANEF criterion for people newly exposed to aircraft operations.

37 The third way in which noise will be minimised is by specifying the hours of operation of the heliport. Nessdee originally proposed to limit the hours in which helicopters can land or take-off at the heliport to be between 7am and 11pm each day. After the further acoustic testing and analysis by Mr Cooper, the night time hours of operation were modified. Mr Wasserman nominated, and Mr Cooper agreed, that for any flights after 10pm (the time of commencement of the acoustic night period) the maximum noise level when measured on FAST response should not exceed 65 dB(A) to address sleep arousal criteria. Mr Cooper determined, from the maximum noise levels measured, that the noisier Squirrel helicopter does not satisfy the nominated sleep arousal limit. Hence, no Squirrel helicopter flights should occur after 10pm. The noise measurements of the operation of the Robinson R44 helicopter revealed that, in terms of the sleep arousal limit, take-offs from helipad H1 after 10pm should not occur, however landings to helipad H3 and, by extrapolation from the noise data, helipad H3A, using the west, south and south-west approaches would satisfy the sleep arousal limit. Mr Cooper's assessment was based on two Robinson helicopter flights between 7pm and 11pm. The acoustic experts, therefore, recommended that for operations after 10pm: no Squirrel helicopter take-offs or landings; no Robinson helicopter take-offs; and Robinson helicopter landings after 10pm must use alternative helipad H3A and approach paths from the west (orange) and south-west (blue).

38 Nessdee modified its proposal to incorporate these recommendations (see condition 46 and 46a). Nessdee proposed a condition specifying that any landing of helicopters after

10pm not give rise to a maximum noise level of 65dB(A) when measured 1 metre outside any bedroom window at any residential dwelling (condition 46c). Nessdee also proposed a further condition restricting the night time flights (after 10pm) to no more than two per night, six per week and 80 per year. All night time flight movements are limited to helicopters operated by Nessdee's businesses, Helicruz and Specialist Helicopters (condition 48).

39 The Council and Mr and Mrs Alston contended for more limited hours of operation, being 7am to 7pm, Monday to Saturday and 8am to 12 noon Sunday (year round). Because of this earlier limit of 7pm on operations, there would be no night time flights and hence no need to impose the conditions recommended by the acoustic experts and agreed to by Nessdee to minimise the risk of sleep arousal between 10pm and 11pm.

40 I find that it would be acceptable to have night time flights up to 10pm. The acoustic experts have assessed the noise from operating both the Squirrel and the Robinson helicopters in the day and between 7pm and 10pm and found that the noise will not exceed either the 20 ANEF or the 13 ANEF criteria. Mr Cooper also assessed the noise for the Robinson helicopter, with two Robinson flights between 7pm and 11pm. The noise from these operations would also meet both the 20 ANEF and the 13 ANEF criteria. The issue concerns sleep arousal between 10pm and 11pm. The acoustic experts agreed that night time operations after 10pm of the Squirrel helicopter and take-off and certain landings of the Robinson helicopter would exceed the nominated sleep arousal limit.

41 I consider that night time operations after 10pm should not be permitted at all. The acoustic experts' assessment that sleep arousal might occur with certain types of helicopters and for certain movements (take-offs and certain landings) would require the imposition of significant restrictions to ensure that night time operations are acoustically acceptable. Yet, such restrictions would be only to enable two flight movements in the hour between 10pm and 11pm on one day, or on three nights in one week, or on 40 nights in one year.

42 When asked why Nessdee needed to have any flight movements between 10pm and 11pm, Nessdee responded that it was to enable helicopters to return to the heliport after operating elsewhere (such as returning from undertaking night time training elsewhere or a returning charter flight). Such purposes could still be achieved by the helicopter concerned starting the return flight earlier, so as to land at the heliport before 10pm.

43 I consider that the marginal benefit of being able to operate between 10pm and 11pm in the restricted manner required to meet the sleep arousal limit is outweighed by the risk of sleep arousal and the intrusion on the amenity of residential receivers in the locality.

44 In summary, I find that no helicopters should be permitted to land or take-off except between the hours of 7am and 10pm Monday to Sunday. The condition fixing the hours of operation should be amended accordingly and the other conditions regulating helicopter operations after 10pm deleted.

45 The fourth way in which noise will be minimised is by specifying the minimum distance

that helicopters using the heliport must keep clear from identified residential receivers. The acoustic experts identified a number of noise sensitive sites (essentially residences) in the locality around the heliport. These sites were identified on a Masterplan in the plan of management (Figure 3). Nessdee proposed a condition requiring that helicopters originating from or terminating at the heliport remain clear of the noise sensitive sites identified in the Masterplan by a distance of not less than 250 metres laterally or 1000 feet vertically. The vertical limit would not apply on take-off or landing, however, the lateral limit would apply at all times (condition 49). The acoustic experts agreed that such a condition would minimise noise contributions.

46 The Council and Mr and Mrs Alston agreed with this condition. Mr and Mrs Alston nominated an additional residence to those originally identified by the acoustic experts. That residence has now been added to the Masterplan. Mr Cooper also identified a further residence when he undertook the further acoustic testing and this residence has also been added to the Masterplan.

47 This condition, when coupled with the requirement that helicopters follow prescribed flight paths, will confine the acoustic impacts of helicopters using the heliport on residential receivers in the locality. Residents who objected to the proposed heliport spoke of the unpleasant experiences in the past of helicopters flying close vertically and laterally over their homes. This condition and the conditions prescribing flight paths should reduce these occurrences in the future from helicopters taking off from or landing at the heliport.

48 The fifth way in which noise will be minimised is by prescribing flight paths that must be followed by helicopters using the heliport. The Council's and Mr and Mrs Alston's original concerns were that the heliport could not be safely used in all weather and wind conditions and hence the assessment of the acoustic impacts of the operation of the heliport was uncertain and not demonstrated to be acceptable. To address these concerns, the parties' aviation experts and acoustic experts further jointly conferred, reassessed and agreed upon the flight paths and landing sites that should be used in different wind conditions and the noise contributions from helicopters using those flight paths and landing sites.

49 The aviation experts agreed on a primary landing site at the existing facility (H1) and two alternate landing sites (H2 and H3A) in the fields to the south of the existing facility. The location of these alternate landing sites underwent revision a number of times during the hearing but has now been settled and identified in the Masterplan. There would be cleared and adequately designated hover taxi routes and taxiways from the two alternate landing sites to the primary landing site. This would be required by a condition (condition 47) that:

> "Cleared and adequately designated hover taxi routes and taxiways are to be provided from the two alternate landing sites (H2 and H3A) to the primary heliport landing site on the alignment provided in the Masterplan, in order to provide for the safe transit of aircraft, in accordance with relevant [Civil Aviation Safety Authority] CASA requirements. Upon completion, the taxi routes and taxi ways are to comply with the description identified in [Civil Aviation Advisory Publication] CAAP 92-2, and is to be certified by an appropriately accredited person."

50 Helicopters using an alternate landing site would land to a hover above the ground at

the site then hover taxi along the designated route to the primary landing site where it would land on the ground.

51 The experts agreed on the wind conditions on which the primary landing site (H1) and the alternate landing sites (H2 and H3A) should be used. Their agreement is reflected in the suggested conditions:

> "42. Aircraft shall not land at the primary landing site at the facility (H1) in adverse wind conditions, considered to be defined as situations where the wind direction is from the south, south-east, east (at more than 5 knots), west (at more than 5 knots), or south-west (at more than 5 knots).
>
> ...
>
> 44. Landing sites H2 and H3A shall only be used in the following wind conditions:
>
> Landing site H2: Landing site H2 shall only be used where wind is from the east (at more than 5 knots)
>
> Landing site H3A: Landing site H3A shall only be used where wind is from the south, south-east, [east (at more than 5 knots)], west (at more than 5 knots), or south-west (at more than 5 knots)."

52 I note that the inclusion in suggested condition 44 of the wind condition from the east as one of the wind conditions in which landing site H3A is to be used seems to be an error, as this is when landing site H2 is to be used and it is not included in the notes to the Masterplan.

53 To ensure that helicopters using the heliport know the wind conditions that are prevailing at the time of landing, a meteorological monitoring station would be installed at the heliport. The suggested condition requiring this is:

> "43. Prior to commencement of the consent, the applicant must install a meteorological monitoring station suitable to record relevant weather conditions including, but not limited to, wind conditions. The station must be capable of delivering wind strength and direction, temperature, and time in a similar manner to an Automated Weather Information System (AWIS). The weather information is to be provided to an automatic replay system accessible by telephone, and/or transmitted by VHF radio for arriving and departing aircraft. Such information as recorded at the meteorological monitoring station must be retained by the applicant for a period of not less than two years and produced by the applicant if requested by an appropriate regulatory authority (such as Orange City Council or the Environment Protection Authority) within a period of 30 days, and in a format that can be appropriately interpreted by Council or the EPA."

54 Nessdee, the Council and Mr and Mrs Alston agreed on these conditions. There was, for a time, some concern raised about one of the alternate landing sites (H3A) being on the far side of the creek on the property and therefore helicopters landing at H3A would have to hover taxi across the creek to return to the primary landing site. However, the aviation experts agreed that the very short distance that a helicopter, undertaking a hover taxi manoeuvre, would need to travel to cross the creek posed negligible safety concerns.

55 The aviation experts agreed on the flight paths that must be used under different wind conditions. Again, these flight paths were revised a number of times during the hearing but have now been settled and identified in Figure 3 of the Masterplan. In summary, the approaches to the primary landing site H1 will be when the wind is from the north-east, north or north-west; the approaches to alternate landing site H2 will be when the wind is from the east; and the approaches to alternate landing site H3A will be when the wind is from the west, south-west, south or south-east. The aviation experts plotted the

different approach paths to these landing sites when the winds are from those directions (shown on Figure 3 of the Masterplan). All of these approach paths commence from the south-east of the facility (along a path described as the South-East Approach Axis) but then diverge in different directions to enable the helicopters to approach the appropriate landing site for the prevailing wind conditions. The departure path for all helicopter flights from the heliport is to be along the South-East Approach Axis.

56 These recommended approach and departure paths were encapsulated in a suggested condition:

> "38. The approach paths for aircraft to the facility are to be in accordance with the Masterplan (as per condition 1), adopting the appropriate path as applicable to the prevailing wind conditions at the facility. The departure path for all aircraft is to be in accordance with the South-East Approach Axis as indicated on the Masterplan. The flight paths described in Figure 3 of the Masterplan and limitations on the use of the heliport shall be made clearly available to all crews using the heliport."

57 All parties agreed with the wording of this condition, except that Nessdee wished to insert the qualification that the departure path should "generally" be in accordance with the South-East Approach Axis. I agree with the Council that this qualification should not be included. Requiring helicopters to use the designated approach and departure paths is critical to ensuring that the noise contributions of helicopters using the heliport will be as assessed and be within the accepted noise criteria.

58 The sixth way in which noise will be minimised is by specifying the numeric noise criteria with which heliport operations must comply. The various measures so far proposed are intended to minimise the noise contributions of helicopters using the heliport so as to be less than the numeric noise criteria of at least 13 ANEF. The criterion of 13 ANEF is equivalent to a noise contribution of LAeq 24 hour 48 dB(A). The acoustic experts suggested, and Nessdee accepted, a condition requiring that the operation of the heliport not give rise to a noise contribution exceeding LAeq 24 hour 48 dB(A) on any day when assessed at any residential receiver identified on the Masterplan (condition 45). The residential receivers identified on the Masterplan were extended to include the residences identified later by Mr and Mrs Alston and Mr Cooper.

59 The Council and Mr and Mrs Alston agreed with the approach of specifying numeric noise criteria but disagreed as to the particular numeric noise criteria that should be specified. The Council accepted the use of a noise contribution of LAeq 24 hour 48dB(A) but contended that, in addition, a maximum noise level should be specified. The Council submitted that this criterion should be:

> "The operation of any helicopter from the heliport shall not give rise to a level greater than a maximum noise level (LMax) of 80 dB(A) when assessed within 30 metres of any residential receiver identified on the Masterplan."

60 Mr and Mrs Alston contended that the LAeq 24 hour noise contribution should not exceed 40 dB(A) (instead of 48 dB(A)) and the LMax should be 78 dB(A) (instead of 80 dB(A)).

61 I find that it is appropriate to require that the operation of the heliport not give rise to a noise contribution exceeding LAeq 24 hour 48 dB(A) on any day when assessed at any

residential receiver identified in the Masterplan. This figure of 48 dB(A) was recommended by the acoustic experts and is the foundation of the 13 ANEF criterion used by them to assess the acceptability of acoustic impacts. Mr and Mrs Alston's suggested lower noise level of 40 dB(A) was derived from the decision in *Lilley v Lithgow City Council* [2007] NSWLEC 608 to grant development consent for a different type of heliport in a different location (over wilderness areas and national parks). It is not an appropriate noise level in this case.

62 I do not agree that specification of a maximum noise level is appropriate or helpful in the circumstances of this case.

63 Neither of the acoustic experts agreed with the Council's suggestion to specify a maximum noise level. Mr Cooper said that the appropriate criterion was the LAeq 24 hour criterion, which averages the noise contributions over a 24 hour period rather than the few seconds used for a maximum noise level. Use of the LAeq 24 hour criterion enables the assessment of compliance with the 13 ANEF criterion, but the maximum noise level does not. Both Mr Cooper and Mr Wasserman said that quick changes in prevailing weather and winds could increase or decrease the maximum noise levels experienced at residential receivers, despite there being no change in helicopter operations. There is also the practical difficulty that there is nothing that the operator of the heliport or pilots of helicopters can do, apart from implementing all of the noise mitigation measures discussed, to ensure that the maximum noise level does not exceed the level stated. Specifying a maximum noise level has, therefore, no action-forcing utility.

64 The seventh way in which noise will be minimised is by specifying the types of activities that can be undertaken at the heliport. Certain activities can give rise to higher noise contributions and greater acoustic impacts than other activities. Nessdee has agreed not to undertake low level training or advance flight training at the heliport, which can involve repetitive low level circuits and take offs and landings. Such activities are noisier. Nessdee proposed, and the Council and Mr and Mrs Alston agreed with, a condition banning such activities:

> "41. The airspace above the Highland Heritage Estate and within a 4 kilometre radius must not be used as a low level training area and/or for advanced flight training. For avoidance of doubt this condition does not prevent trainee pilots taking off and landing for the purpose of flying to and from any training area beyond the boundaries of the Highland Heritage Estate."

65 The eighth way in which noise will be minimised is by requiring the preparation and implementation of a plan of management regulating the operation of the heliport and helicopters using the heliports. A draft plan of management has been produced which identifies, amongst other matters, the primary and alternate landing sites, approach and departure paths, the nearby sensitive receivers and flight movement management. Figure 3 of the plan of management is the Masterplan. The parties agreed that the plan of management would need to be revised to reflect the terms of any decision of the Court to grant approval. The Council originally proposed a deferred commencement condition requiring the plan of management to be finalised and submitted for approval to the Council. The Council subsequently requested that instead, if the Court indicated it would grant consent, the plan of management should be revised in light of the Court's

reasons, and submitted to the Court for approval as part of the development consent.

66 Amongst the revisions the Council contended should be made are that the plan of management should include measures to control the operation of helicopters as well as methods to measure and monitor compliance with any conditions of consent, including tracking and recording the approach and departure paths and altitude of all helicopters, the number of helicopter movements, the types of helicopters, and maintaining and acting upon complaints about helicopter movements, landings and take-offs (see suggested deferred commencement condition A(i) to (iv)).

67 A proper plan of management, revised to address such matters, will be a useful means of ensuring that noise from heliport operations will be as assessed by the acoustic experts and within the accepted noise criteria. Conditions of consent can ensure that operations are carried out in accordance with the plan of management (conditions 1 and 34).

68 The final way in which noise will be minimised is by requiring acoustic compliance testing after helicopter operations commence. The parties agreed that a condition (condition 46b) requiring such testing should be imposed:

> "46b. Within 90 days of issue of an occupation certificate/commencement of the use of the Orange East Heliport an acoustic compliance test shall be undertaken for a full 24 hour period for locations R2, R6 and R7 and the helicopter Leq 24 hour [noise] contribution shall be determined. The testing shall be based on the maximum daily permitted helicopter movements authorised by the development consent and using the [Airbus] AS350 [Squirrel] helicopter. Any issues of acoustic non-compliance shall be addressed by changes/alterations to the Masterplan and subject to retesting to confirm compliance."

69 The implementation of these nine categories of measures to control helicopter operations and mitigate noise will ensure that noise from the operation of the heliport will not only meet the 20 ANEF and 13 ANEF criteria, but also minimise acoustic impacts on residential receivers in the locality.

70 Nevertheless, the Council and Mr and Mrs Alston still contended that helicopter operations would cause unacceptable impacts on the amenity of residents in the locality and of Fredericks Valley itself, justifying refusal of the proposed heliport.

71 The Council and Mr and Mrs Alston contended that compliance with quantitative noise criteria, such as the 20 ANEF or 13 ANEF criteria, is not sufficient to conclude that the acoustic impacts will be acceptable. The Council contended that the Court must make a qualitative assessment based on an understanding of the current acoustic environment of sensitive receivers and the reasonableness of the proposed acoustic impacts on those receivers and Fredericks Valley. The Council referred to the evidence of the parties' planners, Mr Fletcher and Mr Walker, that one would not merely apply an ANEF standard to noise assessment, and that a number of other factors would be taken into account.

72 The Council referred to the evidence of residents who said that they enjoyed the quiet rural atmosphere of Fredericks Valley and surrounding areas and that their enjoyment would be disrupted by noise from helicopter operations. The Council submitted that this quiet rural atmosphere is one of the special aesthetic values of the E3 Environmental Management Zone.

73 The Council and Mr and Mrs Alston submitted that the scale of the proposed heliport will unreasonably impact on the quiet rural atmosphere. The scale of operations includes the number of helicopter movements (20 per day and 90 per week) and the hours of operation, including take-off and landing of helicopters after 7pm. The residents said they are adversely affected by helicopter movements associated with the existing facility (a private helipad) and that these impacts will be made worse by the significant increase in helicopter movements associated with the proposed heliport. The residents said that they had not understood that a heliport could be approved in the E3 Environmental Management Zone. They thought that helicopter operations would have to be confined to Orange Airport.

74 The Council relied on the evidence of Mr Fletcher, a town planner called by the Council, that it was not reasonable to increase the number of helicopter movements beyond the seven movements per week permitted under the existing development consent for the private helipad, on the basis that an alternative location of Orange Airport is available. Mr Fletcher was of the opinion that where capacity exists at Orange Airport to accommodate the additional helicopter flights (that are proposed to be undertaken at the heliport) without causing additional noise to residents beyond exceed the existing 20 ANEF contour, generating new noise impacts to residents surrounding the proposed heliport by operating those flights from that heliport is unacceptable.

75 Mr Walker, the planner called by Nessdee, disagreed with Mr Fletcher. Mr Walker noted that heliports are a permissible use in the E3 zone. He referred to the statement of McClellan CJ in *BGP Properties Pty Ltd v Lake Macquarie City Council* (2004) 138 LGERA 237; [2004] NSWLEC 399 at [118] that:

> "In most cases it can be expected that the Court will approve an application to use a site for a purpose for which it is zoned, provided of course the design of the project results in acceptable environmental impacts."

76 Mr Walker said that the subject site is a suitable location for the proposed heliport and can achieve acceptable environmental impacts, including acoustic impacts (as the acoustic experts demonstrated). The fact that the proposed helicopter flights could be accommodated at Orange Airport is not to the point. The mere existence of an alternative site for a development is not sufficient reason to refuse an application for development at the site proposed. The Court must deal with the development application at hand and determine whether development on the site proposed in that application results in acceptable environmental impacts.

77 I reject the Council's and Mr and Mrs Alston's argument that the proposed heliport will cause unreasonable acoustic impacts on the residents in Fredericks Valley and surrounding areas. The reasonableness of the expectations of residents concerning the type and scale of development that can be carried out in an area is influenced by the zoning and the range of uses permitted. As McClellan CJ said in *BGP Properties Pty Ltd v Lake Macquarie City Council* at [117] and [118]:

> "In the ordinary course, where by its zoning land has been identified as generally suitable for a particular purpose, weight must be given to that zoning in the resolution of a dispute as to the appropriate development of any site. Although the fact that a particular use may be permissible is a neutral factor (see *Mobil Oil Australia Ltd v Baulkham Hills Shire Council (No 2)* [1971] 2 NSWLR 314 at 318-319; (1971) 28 LGRA 374 at 379), planning decisions must generally reflect an assumption that, in some

> form, development which is consistent with the zoning will be permitted. The more specific the zoning and the more confined the range of permissible uses, the greater the weight which must be attributed to achieving the objects of the planning instrument which the zoning reflects (*Lanham's Properties Pty Ltd v Sydney City Council* (1953) 19 LGR (NSW) 163; *Jannsen v Cumberland County Council* (1952) 18 LGR (NSW) 167). Part 3 of the EP&A Act provides complex provisions involving extensive public participation directed towards determining the nature and intensity of development which may be appropriate on any site. If the zoning is not given weight, the integrity of the planning process provided by the legislation would be seriously threatened.
>
> In most cases it can be expected that the Court will approve an application to use a site for a purpose for which it is zoned, provided of course the design of the project results in acceptable environmental impacts."

78 In this case, the development site and the residences in Fredericks Valley and surrounding areas are within the E3 Environmental Management Zone. That zone expressly confines the range of permissible developments. The purpose is, as the second objective states, "to provide for a limited range of development that does not have an adverse effect on those values". "Those values" are the "special ecological, scientific, cultural or aesthetic values" of areas included in the E3 zone. The limited range of permissible development includes air transport facilities, which includes a heliport open to the public, and helipads not open to the public. The scale of the former development (which ordinarily will be designated development with more than 7 flight movements per week) is larger and more intensive than the latter development (which might not be designated development).

79 In these circumstances, residents in the E3 zone cannot reasonably have expected that heliports could not be carried out with consent in the E3 zone or that any additional helicopter operations would be confined to the existing Orange Airport. Similarly, Mr Fletcher's view that whilesoever Orange Airport has capacity for additional helicopter flights, it is unreasonable to approve the establishment of a heliport at another location is at odds with the strategic planning reflected in the zoning and the Land Use Table for the E3 zone.

80 It is of some importance that the Standard Instrument – Principal Local Environmental Plan on which Orange LEP is based does not specify air transport facilities or helipads as development permitted with consent in the E3 zone. The Council made a deliberate strategic planning decision to especially include air transport facilities and helipads as development permitted with consent in the E3 zone. Furthermore, the Council did not include any provisions confining the location of such development in the zone or restricting the carrying out of such development until Orange Airport reaches capacity.

81 There also can be no reasonable expectation that consent should not be granted to development of a site for a purpose for which it is zoned unless and until development on another site reaches capacity. Neither the EPA Act nor Orange LEP supports such an expectation. Similarly, the mere existence of an alternative site that has capacity to accommodate a proposed development does not make it unreasonable to grant consent to that development at the proposed site. A consent authority's obligation is to consider and determine the development application that has been made for the identified development on the identified land. If development on that land is permissible and acceptable (having regard to all the relevant matters), it should be approved. Development on that land does not become unacceptable because the development

could also be carried out acceptably on other land.

82 Returning to the issue of the qualitative acceptability of the proposed heliport in the rural setting of Fredericks Valley, I find that the development, confined in its operation and with the mitigation measures I have determined to be appropriate, will not have unreasonable or unacceptable acoustic impacts on the aesthetic values of the valley or the amenity of residents in the area.

83 One further issue about noise needs to be addressed. Mr and Mrs Alston raised concern that noise and vibration from helicopters using the heliport might give rise to rattling of the windows of the heritage house "Wellwood", identified as residential receiver R2. If so, this might lead to acoustic treatment of the windows to mitigate noise and vibration, which might adversely affect the heritage values of the house.

84 The acoustic experts examined this issue on a number of occasions. In particular, during the further acoustic testing in August, both experts attended the house to observe any effect of helicopter operations during the testing on the house. Observations during the Squirrel helicopter taking off from and landing at helipad H1 could not detect any vibration of the dining room window (the large window said by the residents to be affected during nearby helicopter flights). The acoustic experts agreed that vibration of windows is caused by raised levels of low frequency noise but that the types of helicopters currently used and to be used at the heliport do not generate sufficient low frequency noise to cause vibration of the windows.

85 The acoustic experts agreed that the proposed helicopter operations at the heliport will not raise an issue in terms of vibration to the windows at the house at R2. They agreed that there is no reason for the provision of double glazing or noise control measures to be undertaken to the house.

86 I agree with the acoustic experts that the proposed helicopter operations at the heliport will not cause sufficient vibration to the windows at the house "Wellwood" to necessitate undertaking any double glazing of the windows or other noise control measures interfering with the fabric of the house and the heritage values of the house.

The acceptability of the visual impacts

87 Although the Council and Mr and Mrs Alston raised the contention that the proposed heliport would have adverse visual impacts upon Fredericks Valley, this turned out to be a narrow issue.

88 The parties' planners agreed that the visual impact of the heliport is essentially limited to the increased movement of helicopters and that there are no significant visual impacts arising from the existing or proposed ground facilities. They agreed that if visual impact was the only contention, it would not be sufficient to warrant refusal of the heliport. The only question about the visual impacts that the planners raised was the increase in the number of helicopter movements from the 7 movements per week for the existing private helipad to the 90 movements per week for the proposed public heliport. Although the planners agreed that this increase in helicopter movements would not be perceived to be a significant visual impact to the average casual observer, it might be perceived to be a significant impact to a sensitive observer.

89 I find that the number of helicopter movements that would be permitted per day (20) or per week (90) will not cause a significant visual impact on residents or on the aesthetic values of Fredericks Valley. The relevant inquiry is not whether the *increase* in helicopter movements from the existing helipad to the proposed heliport would be perceived to cause a significant impact, but rather whether the actual number of helicopter movements for the proposed heliport would have an unacceptable visual impact. The acceptability or unacceptability of the visual impact is not to be judged from the viewpoint of the sensitive observer, but rather the reasonable person living or working in or visiting the locality. The reasonable person is to be attributed with knowledge that the proposed development of a heliport, with its attendant characteristics and scale, is permitted with consent in the zone, including on the subject site.

90 I find that the proposed heliport, with the particular limitations proposed including on the number of helicopter movements, flight paths, landing sites and hours of operation, will not result in unacceptable visual impacts to the reasonable person in the locality.

The acceptability of the combined noise and visual impacts

91 I have found above that the proposed heliport will not result in unacceptable noise impacts or visual impacts. For the same reasons, I also find that the combination of the noise impacts and visual impacts will not be unacceptable.

The adequacy of the environmental impact statement for the heliport

92 The Council raised two contentions that the environmental impact statement ("EIS") did not adequately address the statutory requirements for an EIS, including the requirements of the Secretary of the Department of Planning. Because the proposed heliport was designated development, the development application needed to be accompanied by an EIS (s 78A(8)(a) of the EPA Act). The EIS must be in the form prescribed by the regulations. Schedule 2 of the EPA Regulation prescribes the requirements for an EIS.

93 Clause 3(8) of Sch 2 of the EPA Regulation requires the applicant responsible for preparing an EIS to ensure that the EIS complies with any environmental assessment requirements that have been provided by the Secretary. In this case, the environmental assessment requirements provided by the Secretary included: "Project justification – The EIS must include a detailed justification of the proposal considering alternatives and including the need for the project as well as the impacts if the project were not to be carried out".

94 Clause 7 of Sch 2 specifies the content of an EIS, including in cl 7(1)(c):

> "an analysis of any feasible alternatives to the carrying out of the development, activity or infrastructure, having regard to its objectives, including the consequences of not carrying out the development, activity or infrastructure".

95 Clause 7(1) is subject to the environmental assessment requirements provided by the Secretary that relate to the EIS (cl 7(2) of Sch 2).

96 The Council contended that the EIS failed to properly address the requirements to provide a detailed justification of the development, consideration of alternatives, the

need for the development and the impacts if the development were not to be carried out.

97 The Council put this contention not as a legal or jurisdictional point. The Council did not contend that the failure to properly address these matters in the EIS caused the EIS not to be an environmental impact statement for the purposes of the EPA Act and the EPA Regulation, with the consequence that the Court would have no power to determine the development application for the heliport by granting consent. (The requirement for an EIS to accompany a development application for designated development is jurisdictional: see *Helman v Byron Shire Council* (1995) 87 LGERA 349). Rather, the Council submitted that the environmental assessment requirements of the Secretary and of Sch 2 of the EPA Regulation added a layer of assessment that a consent authority needed to consider beyond that required for development that is not designated development. The Council submitted that the consent authority was required to consider whether the proposed development is justified by reference to the need for the development (considering alternatives as well as the impacts if the project were not carried out). The Council submitted that it is not enough to say that the zoning permits the proposed development when there is a further hurdle to cross of whether the proposed development is justified having regard to other alternatives that could meet the applicant's needs and have less impacts on the community.

98 I will shortly address the various ways in which the Council contended that the EIS failed to properly address the justification and need for the development, the alternatives to the development, and the impacts if the development were not to be carried out. But I should note at the outset that this argument did not assist me in my consideration and determination of the development application for the proposed heliport in the circumstances of this case. As I have explained earlier, I have found that the proposed heliport, as amended and with the limitations on operations and the mitigation measures that I have found to be appropriate, will not have unacceptable noise or visual impacts. The development of a heliport is identified as one of the limited range of developments permitted with consent in the E3 zone. The particular site proposed for the heliport will be suitable for helicopter operations in the ways now proposed.

99 In these circumstances, even if the EIS were to have included an inadequate consideration of the justification or need for the development or the alternatives to the development or the impacts if the development were not to be carried out, this would not change my findings of the suitability and acceptability of the heliport on the site proposed. This conclusion might be different if the suitability or acceptability of the development on the site proposed was marginal, only barely being suitable or acceptable. Then, a weak justification or need for the development or the existence of a much better site for the development where there would be much less environmental impacts might tip the balance, justifying the refusal of the development on the site proposed. But this is not the present case.

100 I return to summarise the ways in which the Council contended that the EIS was inadequate. Nessdee produced an EIS and two addenda. The EIS of September 2015

contained four sections addressing the topics required by the Secretary of the need for the project (3.2), justification (3.3), alternatives (3.4) and consequences of not proceeding (3.5).

101 In relation to the need for the project, the EIS noted that initially Nessdee needed to improve connectivity between the operations in Orange (at the Highland Heritage Estate) and in the Hunter Valley. Opportunities for diversification of the business into tourism and other sectors were then identified, such as use by visitors to and users of the Highland Heritage Estate, including wedding parties and tourists. The proposal is to expand the use of the site and provide opportunities in the region for tourism, flight training and other uses.

102 In relation to justification of the proposal, the EIS stated that the heliport with a part tourism focus would have benefits for the tourism sector of Orange and flow on benefits for the town and region. The heliport would also provide a high quality aircraft facility that is an alternative to Orange Airport for helicopters visiting the region.

103 Section 10.1 of the EIS provides a summary of the justification for undertaking the proposal:

> "In summary the proposal is considered to be justified on the basis that [it]:
>
> • Is consistent with the zoning of the area and represents an approved use;
>
> • Represents a logical expansion of existing facilities that provides an improved business opportunity within an existing location, rather than developing a greenfield site;
>
> • Provides an alternative site for visitors to the region thereby improving the attractiveness of the region as a destination;
>
> • Provides an opportunity for flight training within the region thereby operating as an attractor for visitors and having flow on tourism and business benefits;
>
> • The site is suitable for the proposal; and
>
> • Is consistent with the principles of ecologically sustainable development."

104 In relation to alternatives considered, the EIS noted that "[g]iven the existing consent for use of the site, no alternative sites were considered." This was a reference to the current development consent for the helicopter landing site (which is a helipad under the current definition). The EIS did consider alternatives to the operation of the heliport proposed in the development application. These alternatives included "a range of business models, various take-off and landing approach path options, the use of different machines [helicopters], and the use of the site by emergency machines (including PolAir and the Aeromedical helicopters)."

105 In relation to the consequences of not proceeding, the EIS noted that they were that:

> "• The development would not appropriately take advantage of the expansion opportunities identified; and
>
> • The region would not benefit from improved tourism and training opportunities."

106 The EIS Addendum of 6 November 2015 further addressed the need for the project (1.1.1); justification (1.1.2) and alternatives (1.1.3). In relation to the need for the project, the Addendum accepted that the project results in a change of use of part of the site from a helicopter landing site to a heliport, but said that the reason was to "diversify and value add to current operations". Nessdee had identified a demand in the

region for increased tourism opportunities, particularly in conjunction with local tourism events such as Food and Wine Weeks and local sporting events. All of these events attract tourists to the region and the provision of enhanced tourism opportunities, such as tourist and charter flights, adds to the appeal and attraction of the region as a whole. Charter helicopter flights offer a unique transport option for visitors. Improved tourism to the region benefits the community as a whole and ensures a diverse economy. The Addendum also noted that development of the facility enables other opportunities such as flight training, further adding value to the operation and improving economic viability.

107 In relation to justification, the Addendum noted that utilising the existing infrastructure on site to develop the facility represents an appropriate use of resources rather than developing a second facility with increased construction costs and environmental impacts. The Addendum stated that:

> "The strategic acceptability of the proposed land use is provided by virtue of the permissibility of the use in the zone. On a site by site basis, consideration of a proposed land use against the relevant zone objectives, together with an assessment of anticipated impacts, confirms the compatibility of the land use with the local area."

The Addendum concluded that: "On balance it is considered that the justification of the use of the site for a heliport is not antipathetic to the LEP and zone objectives."

108 In relation to alternatives, the Addendum reasserted that:

> "utilisation of the existing site and infrastructure precluded the consideration of alternative sites. To close and dismantle this facility and redevelop elsewhere, or to develop a second facility, was considered cost prohibitive and a poor use of resources. The subject site is beneficially located in close proximity to Orange to take advantage of tourists arriving from Sydney or those staying in Orange or the surrounding area."

109 The Addendum did then consider briefly the alternative site of Orange Airport:

> "Similarly, the prospect of the development occurring at the Orange Airport was dismissed on the basis that the location is less accessible, that other competing businesses operate from this location, and also because the part-tourism/charter focus of the business has clear linkages with the existing tourism function of the site (ie wine tasting, functions, weddings etc). The proposal augments these current uses and assists in development and cementing the ongoing viability of the site."

110 The Addendum concluded that "alternative locations for the land use were discounted and the subject site is considered the most appropriate site."

111 The EIS Addendum (2) of May 2016 (revised) responded to the Council's request for clarification on the justification for the development (1.6.1), the consequences of not carrying out the development (1.6.2) and the alternatives to carrying out the development (1.6.3).

112 The section on justification of the development (1.6.1) is extensive and detailed (over 12 pages). As Addendum (2) noted:

> "In assessing whether the proposed heliport and ancillary features is justified, consideration has been given to both biophysical and socio-economic factors, including the potential for residual effects on the environment and the potential benefits of the project."

The subsection on biophysical factors considered the impacts and mitigation measures relating to traffic and access, noise, surface and ground water and hazards. The subsection on socio-economic benefits considered how the project would:

> "• Provide a high quality, safe and accessible heliport that is proximal to town, connects with other related tourism ventures and provides opportunities for diversification of the

applicant's related business holdings; and

• Bolsters and supports the local and regional tourism industry and through this, the local economy."

The subsection expanded on these benefits.

113 The subsection on justification of specific elements analysed the use of a helicopter landing site for business related purposes, tourism in the form of joy flights, private charter, pilot training, emergency use by the operator and use by private operators and the justification for these uses. The subsection also addressed the uses of the site considered ancillary to the dominant uses of the heliport, including pilot training and pilot accommodation.

114 The section on the consequences of not proceeding (1.6.2) noted that they would be that the opportunities offered by the proposed development, which would benefit Nessdee and the wider community, would not be realised. The section also addressed the consequences of not proceeding with the ancillary uses of pilot training and pilot accommodation.

115 The section analysing alternatives (1.6.3) focused on the "logical alternative to development of the subject site is to utilise the existing facilities at Orange Airport to host the development." The Addendum (2) stated that this is not a viable option for Nessdee for six reasons: safety and security (including vandalism of equipment at Orange Aiport); one stop shop (the benefit and attraction of offering multiple tourism elements in one location, such as the heliport with the existing function centre and cellar door); non-commercial use (housing and staging the helicopter from Orange Airport for the current business use is impractical); tourism benefits not realised (not proceeding with the project at the existing site would not realise the opportunity to bolster and diversify the region's tourism industry); value add to local business (not proceeding with the project at the existing site would not realise the opportunities to enhance the viability of the existing business and its capacity to contribute to the local and state economy); and duplication of services (proceeding with the project at the existing site will not unacceptably duplicate services or lead to increased flight activity and reduced safety for users).

116 The Council criticised the arguments advanced in the EIS, EIS Addendum and EID Addendum (2) for the need for and justification of the proposed heliport and discounting the alternative site of Orange Airport. The Council submitted that there was not an analysis of the alternative of operating the business (the various activities proposed to be carried out at the heliport on the existing site) from Orange Airport and transporting clients the 7km to the existing facility.

117 The Council submitted that the existence of unlawful infrastructure at the existing site (some of the buildings and structures erected went beyond what was authorised by the existing development consent for the helipad) should not be able to be relied upon to justify the proposal and discount use of alternatives.

118 The Council relied on the view of Mr Fletcher that Orange Airport has capacity to accommodate all of the proposed activities and that the acoustic and visual impacts of the proposed heliport at the existing site are unreasonable when Orange Airport can provide the services that Nessdee desires. By using the existing Orange Airport,

impacts from helicopters are able to be confined to one location rather than spreading the impacts across the community.

119 I reject these criticisms of the Council. They do not establish that the EIS as a whole (the EIS, EIS Addendum and EIS Addendum (2)) inadequately or improperly assessed the matters required by the environmental assessment requirements of the Secretary or the EPA Regulation. The EIS as a whole clearly did include an analysis of the need for and justification of the development of the proposed heliport at the existing site, feasible alternatives to the carrying out of that development, and the consequences of not carrying out that development. The Council just disagrees with that analysis. But this does not make the analysis inadequate.

120 The analysis in the EIS is based on the objectives of the proposed development to encourage synergies with and otherwise build the existing business and to diversify the business operations at the existing site. These objectives underpin the need for and justification of the proposed development at the existing site and the consequences of not proceeding with the development on the existing site. The objectives of the development also explain why conducting helicopter operations at another site, Orange Airport, is not a feasible alternative. Clause 7(1)(c) of Sch 2 of the EPA Regulation requires an analysis of any feasible alternatives to the carrying out of the development "having regard to its objectives." Carrying out the development on a site other than the site on which the existing business of the function centre and cellar door and the existing facility of the helipad are conducted would not achieve the objectives of co-location and diversification of business operations on the existing site.

121 I find that the EIS as a whole has included an analysis of the matters required by the Secretary and the EPA Regulation. I have taken this analysis of these matters into consideration in determining the development application for the proposed heliport at the existing site.

The public interest

122 The Council and Mr and Mrs Alston contended that the proposed heliport is not in the public interest as it does not represent the orderly and economic development of land in accordance with the planning regime. The Council submitted that:

> "When weighing up the zoning of the land, the fact that the proposal is for designated development, the proximity to Orange Airport which can provide services to the applicant at the intensity it desires and the intrusiveness of the helicopter noise on surrounding residents of consistent events each week, the Court would conclude that on balance the public interest would be served by refusing the application."

123 I do not agree. The zoning of the land permits the development of a heliport on the land. The declaration of heliports as designated development triggers heightened environmental impact assessment (in the form of an EIS) but does not affect the determination to grant or to refuse development consent. The Council is in error in asserting that because the proposal is designated development, the public interest is served by refusing the development.

124 The capacity of Orange Airport to accommodate the helicopter operations proposed by Nessdee is not a reason to refuse the application for the development of the existing

site. I have found that the proposed heliport would have acceptable environmental impacts (including noise and visual impacts). The helicopter noise would not be intrusive on surrounding residents, but will meet accepted numeric noise criteria. Indeed, the proposed heliport will operate, and will be required to operate, to ensure compliance with the 13 ANEF criterion, a lower criterion than the 20 ANEF criterion applying to Orange Airport. Hence, contrary to the Council's assertion, operation of the heliport will not result in any additional land being exposed to noise levels of 20 ANEF or above.

125 In these circumstances, the public interest does not favour refusing the application for the proposed development.

Conditions of consent

126 I find that the proposed heliport is an appropriate use of the land and that the impacts of the development will be acceptable and can be managed satisfactorily by appropriate conditions of consent. The parties have agreed on many of the conditions on which consent should be granted. There were, however, some areas of disagreement.

127 The first area of disagreement concerned the conditions regarding helicopter operations, including hours of operation, flight movements, approved aircraft, flight paths, and noise limits. I have addressed the issues of disagreement concerning those matters in my discussion of the noise mitigation measures. The conditions need to be amended to reflect my rulings. This would include restricting operations to 10pm and deleting conditions regulating operations after 10pm.

128 The second area of disagreement concerned the ancillary uses of pilot training and pilot accommodation. Mr and Mrs Alston argued that these ancillary uses should not be permitted and conditions dealing with the uses deleted. Nessdee did not propose to conduct low level training or advanced flight training for pilots in the airspace above or within a 4km radius of the heliport. A condition of consent would enforce this (condition 41). Instead, such training would be undertaken at training areas further away from the heliport. However, pilots undertaking such training could take off and land at the heliport for the purpose of flying to and from the training areas further away. The only pilot training proposed to be conducted at the heliport is classroom based pilot training. Classrooms will be provided in the new building proposed. Accommodation for students undertaking pilot training is also proposed to be provided in the new building. The number of students who can undertake classroom based pilot training and stay in the pilot accommodation is very small, only 4 students. This would be enforced by a condition (condition 27b).

129 I consider this restricted use for classroom based pilot training and pilot accommodation to be acceptable. No party contended, and there is no evidence, that these uses will cause any environmental impacts. Accordingly, the conditions regulating these uses should remain.

130 The third area of disagreement concerned fuel storage and refuelling areas and the potential contamination of surrounding waters. Mr and Mrs Alston expressed concern

that spills on hardstand areas of the facility may escape and contaminate the creek to the east. They noted that the site and the creek are in the Orange drinking water catchment.

131 Nessdee responded to this concern by providing a draft stormwater management report dated September 2017. The report describes the system and management measures to:

> "• Manage water quality risks to a low level in the Orange drinking water catchment;
>
> • Manage site stormwater runoff to ensure that post development loads are less than pre-development loads;
>
> • Ensure that all potentially contaminated stormwater associated with day to day operations is managed by a suitable sized and operated stormwater quality improvement device (SQID);
>
> • Capture 100% of any large hydrocarbon or chemical spills for removal off-site and treatment/disposal; and
>
> • Capture 100% of firefighting water including diluted firefighting foams in the event of a fire emergency, for removal offsite and treatment/disposal."

The Stormwater Management Plan included plans depicting the system and structures for managing stormwater and controlling erosion and sedimentation.

132 Conditions of consent would require finalisation and implementation of the finalised Stormwater Management Report (Condition 1). Condition 11 requires:

> "Stormwater runoff from the apron, refuelling and storage tanks must be adequately treated to remove pollutants prior to discharge into the catchment. Significant fuel spills (being spills which cannot be dealt with by the use of a single spill kit) and fire-fighting foam shall be collected and retained on site and discharged of by pump out, via a contractor. The pump out truck is to operate from the hard stand area. The details of the proposed system to treat pollutants shall be submitted to and be approved by Orange City Council prior to the issue of a Construction Certificate.

133 Mr and Mrs Alston suggested a rewording of this condition to require that:

> "Stormwater runoff from the apron, refuelling and aviation fuel tanks must not be permitted to be discharged into the catchment and must be collected and discharged off-site in accordance with EPA and NSW Water Quality Objectives (WGOs)...".

134 Other conditions of consent require the operator of the heliport to comply with the general terms of approval issued by the Environment Protection Authority and included as conditions of consent. These include the following conditions 50 to 52:

> "50. The applicant must provide storage on site of appropriate and suitable biodegradable fire-fighting foam that does not contain per-and/or poly-fluoroalkyl substances (PFAS) in a sufficient quantity to respond to a fuel or chemical incidents including a fuel or aircraft fire or fuel spill, and stored in a manner so as to be accessible by Fire and Rescue NSW in a fire incident. Such arrangements to be provided to the satisfaction of Fire and Rescue NSW prior to the commencement of the use.
>
> 51. Fuel storage and refuelling areas and the landing apron are to be designed, installed and maintained in accordance with AS1940 as applicable to the satisfaction of Council or the EPA, to ensure containment of fuel, chemicals, oil and fire-fighting products, including but not limited to fire-fighting foams. Design details are to be provided and approved by Council prior to issue of a construction certificate.
>
> 52. The fuel storage and refuelling areas and landing apron are to be designed to discharge any potentially contaminated stormwater to a containment device for treatment prior to discharge. Significant fuel spills (as defined in condition 11) and fire-fighting foam shall be collected and retained on site and discharged of by pump out, via a contractor. The pump out truck is to operate from the hard stand area. Such system is to be designed, installed and maintained to the satisfaction of Council. Design details

> are to be provided to and approved by Council prior to issue of a construction certificate. Such systems must have sufficient capacity to accommodate a spill volume (at least) equal to or exceeding the maximum fuel storage volume."

135 Mr and Mrs Alston suggested a rewording of condition 52 to be consistent with their view that there should never be any discharge to the catchment and everything must be collected and discharged off-site.

136 I find that the system and management measures to deal with site stormwater runoff, contaminated stormwater, hydrocarbon or chemical spills and firefighting water are now adequate. The conditions of consent proposed by Nessdee are satisfactory but their wording needs to be clarified to be consistent with each other and to ensure the finalisation and implementation of the stormwater management plan (to be implemented at all times and not just before issue of the construction certificate).

137 The fourth area of disagreement was the duration of the consent. Mr and Mrs Alston submitted that a condition should be imposed that:

> "The use permitted by this consent will cease at the expiration of five (5) years from the date this consent is granted. Any further development application to continue the use must be lodged before the end of the five year period."

Mr and Mrs Alston noted that such a condition was imposed by the Court in granting consent to a heliport in *Lilley v Lithgow City Council* [2007] NSWLEC 608.

138 Nessdee opposed the condition.

139 I do not consider it is necessary to impose a condition limiting the duration of the consent. There has now been adequate description of the development, the environment likely to be affected by the development, the likely impact on the environment of the development, and the measures proposed to mitigate any adverse effects on the environment of the development. This has permitted an assessment and a finding that the development can be carried out without resulting in unacceptable environmental impacts. Conditions of consent can ensure that this occurs. These conditions can be enforced. In these circumstances, it is not necessary to fix, in effect, a trial period of 5 years for the operators to establish that the development can be carried out without causing unacceptable environmental impacts.

140 The fifth area of disagreement was the enforceability of the conditions regulating helicopter operations. Mr and Mrs Alston queried whether the various conditions regulating helicopter operations, particularly the flight paths, minimum distances to residential receivers and helipads to be used, are within power and enforceable, having regard to the federal aviation authorities' functions to deal with these matters. I do not share these concerns. A consent authority determining a development application under the EPA Act and the Court exercising the functions of the consent authority on appeal have power to impose the conditions in granting consent to the heliport. The functions of the federal aviation authorities to regulate aviation are not in conflict and do not displace the functions of the consent authority and the Court.

Directions to finalise the proceedings

141 The parties need now to finalise the documentation (such as the plans of management) and conditions of consent so as to enable the Court to grant development consent to the proposed heliport. I will make directions for this to occur. I will fix a return date

before the Court in case a party wishes to make any further submission about the revised documentation and conditions of consent. The parties should prepare and provide on that occasion agreed or competing minutes of the orders that the Court should make, including granting leave to amend the development application, ordering the payment of costs under s 97B of the EPA Act, upholding the appeal and granting consent on conditions.

142 The Court orders:

(1) The applicant is to prepare, file and serve a Plan of Management for Orange East Airport, a Stormwater Management Report for the Proposed Heliport and any further plans by 8 December 2017.

(2) The parties are to confer and agree on the conditions of consent (revised in accordance with the Court's rulings) by 13 December 2017 and file the revised conditions by 14 December 2017.

(3) The proceedings are listed on 19 December 2017 at 9:30am for further hearing and disposal of the proceedings.

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Decision last updated: 28 November 2017