

Before Queenstown Lakes District Council

In the matter of the Resource Management Act 1991

And

In the matter of the Queenstown Lakes District Proposed District Plan Topic
07 Designations

Statement of Evidence of Malcom Hunt

Dated 7 October 2016

Wyuna Preserve Residents Association Incorporated (0744)

Solicitors

Anderson Lloyd
M A Baker-Galloway | R E Hill
Level 2, 13 Camp Street, Queenstown 9300
PO Box 201, Queenstown 9348
DX Box ZP95010 Queenstown
p + 64 3 450 0700 | f + 64 3 450 0799
maree.baker-galloway@al.nz | rosie.hill@al.nz

**anderson
lloyd.**

1. INTRODUCTION

- 1.1 My full name is Malcolm James Hunt.
- 1.2 I am a self-employed noise consultant, a position I have held for 25 years at my Wellington based firm, Malcolm Hunt Associates, an environmental consultancy firm specialising in environmental noise and vibration.
- 1.3 Details of my qualifications and relevant past experience are at **Appendix A** to this evidence.

2. CODE OF CONDUCT

- 2.1 I confirm that I have read the code of conduct for expert witnesses as contained in the Environment Court's Practice Note 2014. I have complied with the practice note when preparing my written statement of evidence, and will do so when I give oral evidence before the hearings panel.
- 2.2 The data, information, facts and assumptions I have considered in forming my opinions are set out in my evidence to follow. The reasons for the opinions expressed are also set out in the evidence to follow.
- 2.3 Unless I state otherwise, this evidence is within my sphere of expertise and I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express.
- 2.4 I understand it is my duty to assist the hearing commissioner impartially on relevant matters within my area of expertise and that I am not an advocate for the party which has engaged me.
- 2.5 In preparing this evidence I have reviewed:
 - (a) Original submissions to the public notification of designations, specifically those of the Wyuna Residents Association, Skydive Queenstown, and Skytrek Tandem Hang Gliding & Paragliding;
 - (b) QLDC s.42A Planners report Chapter 37 (designations) – by Ms Rebecca Holden, specifically, the extract of revised designation for Glenorchy Airstrip (#239);
 - (c) Council's most recent amendments to Chapter 36 (noise) attached to the Reply of Ruth Evans on Behalf of Queenstown Lakes District Council dated 22 September 2016
 - (d) NZ Standard NZS6805:1992 *Airport Noise Management & Land Use Planning*.
 - (e) The Glenorchy Airstrip Reserve Management Plan, 2016.

3. SCOPE OF EVIDENCE

- 3.1 I have been asked by Ms Maree Baker-Galloway of Anderson Lloyd to prepare evidence in relation to the control of aircraft noise within the designation for Glenorchy airstrip currently under consideration by Queenstown Lakes District Council (the "Council") as part of hearing of submissions on the Proposed District Plan – Stage 1.
- 3.2 My evidence sets out some general comments on the issue of annoyance to aircraft noise, discusses appropriate controls of noise effects in relation to the use of airstrips (not involving the more intensive provisions of NZ Standard NZS6802:1992 and sets out a discussion on appropriate methods for the control of aircraft noise at the Glenorchy Airstrip specifically in relation to:
- (a) Numbers of aircraft movements per day;
 - (b) Types of aircraft;
 - (c) Hours of use;
 - (d) Flight paths;
 - (e) Ground running and noise from non-aircraft activity at the Glenorchy Airstrip.
- 3.3 I comment on the approach to controlling noise emissions arising from the use of the Glenorchy Airstrip I understand Council are seeking to impose through the Designation. At the conclusion of my evidence I summarise recommendations for the control of noise emissions arising from the use of the Glenorchy Airstrip.

4. EXECUTIVE SUMMARY

- 4.1 Noise from the operation of light propeller aircraft and helicopters utilising Glenorchy Airstrip has the potential to adversely affect outdoor amenity and living conditions for nearby residents including those located within the Wyuna Preserve located adjacent to the Airstrip.
- 4.2 My enquiries with the residents of the Wyuna Preserve indicate the effects of noise emanating from the Airstrip include detraction of the Amenity of the area as a place to live as well as temporary with outdoor speech interference and verbal communications such as talking on the telephone. The closest approved dwelling site within the Wyuna Preserve appears to lie within 300 metres of the extended centreline of the Glenorchy Airstrip.
- 4.3 Based on the feedback I have received, there appears a clear case for improved measures to control noise from aircraft operating from the Airstrip, including those aircraft which overfly the Wyuna Preserve regularly and cause the noise effects complained of.
- 4.4 I have recommended that the designation of the Glenorchy Airstrip be amended to include two key provisions:

- (a) That a Noise Management Plan be developed which governs the use of the airstrip for noise control purposes
 - (b) That sets a clear requirement for all aircraft activity at the Airstrip to be carried out in accordance with the Noise Management Plan developed for this purpose.
- 4.5 Such provisions attached to the RMA designation for the Airstrip, together with restrictions on daytime use only of the airstrip and constraints around commercial activities taking place within the designated land would form an acceptable basis for the control of noise in my view.

5. AIRCRAFT NOISE ANNOYANCE AT GLENORCHY AIRSTRIP

- 5.1 Aircraft noise is a factor, which has attracted a great deal of community attention in the vicinity of airports and airfields around New Zealand. Noise can be generated in a community from a number of different sources, however, in the proximity of airfields, aircraft noise is often the loudest and most readily identifiable single source of noise.
- 5.2 The most effective means of reducing the negative reaction of the local communities to airport noise is to both control aircraft noise and to control the development of noise-sensitive activities in the vicinity of the airport or airstrip. This is the approach of a relevant NZ Standard NZS6805:1992 *Airport Noise & Land Use Planning* which as I explain below is not considered an appropriate mechanism to control noise from the Glenorchy Airstrip.
- 5.3 Glenorchy Airstrip is a low volume, non-certified aerodrome situated just south of the township of Glenorchy that is located in what I would term a "high amenity" natural noise environment.
- 5.4 The grass strip is used by small private fixed wing aircraft and helicopter operations and is also a base for skydiving and other recreational aeronautical activities. I understand there has also been some agricultural use of the airstrip as it is used at times by Wyuna Station and occasionally by Greenstone Station.
- 5.5 I also understand currently the Airstrip is utilised by Skytrek Tandem Hang Gliding & Paragliding for the sport of tandem hang gliding. I understand this activity involves the use of a small microlight aircraft to pull the hang glider into the sky to 2,500 feet overhead the Airstrip. Once the hang glider has achieved this height, the pilot releases from the tow rope and the hang glider glides down to land back on the airstrip.
- 5.6 In an effort to reduce the time and distance of hauling the hang glider to the desired detachment height, the microlight (towing the hanglider at a high power setting) performs a helical flight path in the form of circles of increasing height above the airstrip, which has the effect of concentrating noise from this activity in the vicinity of the airstrip. Residents of the Wyuna Preserve not only experience the noise associated with the take-off and landing of aircraft at the Airstrip, but I am also informed they suffer the annoying sound of Skytrek Tandem Hang Gliding & Paragliding's microlight as it climbs out

towing the hanglider. I am informed that of all the types of sounds from the different aircraft and helicopters using the Airstrip, this is the most annoying type of noise that the Wyuna Preserve residents have to put up with.

5.7 It is for this reason that I recommend the below controls on noise from aircraft using the Glenorchy Airstrip that not only cap the daily aircraft use of the Airstrip and hours of operation, but also the flight tracks selected by aircraft using the Airstrip and that these controls are approved to manage the effects of noise experienced on the ground as well as for aircraft safety reasons.

6. **NZS6805:1992**

6.1 NZ Standard NZS6805:1992 *Airport Noise Management & Land Use Planning* utilises a system based on the Day/Night Sound Level (Ldn) unit of noise measurement which uses the cumulative 'noise energy' produced by all flights during a typical day with a 10 decibel penalty applied to night flights. Ldn is used extensively for airport noise assessment in New Zealand and overseas.

6.2 NZS68035:1992 recommends an approach that limits the average daily amount of aircraft noise exposure that is permitted in the fixed vicinity of the aerodrome (allowing for future growth). Only inside this fixed working area (defined by the "Airnoise Boundary" set at a forecast level of Ldn 65 dB) is noise allowed to be greater than this. Beyond this area, an area experiencing less aircraft noise is recommended to be identified by establishing the "Outer Control" boundary set at the forecast level of Ldn 55 dB. In summary, the recommendations of NZS6805:1992 require that noise sensitive uses do not locate on land within the future Ldn 65 contour area (Airnoise Boundary), but are permitted within the Ldn 55 to 65 area (Outer Control Boundary) so long as the district plan permits this, subject to acoustic insulation being incorporated within any new or altered buildings housing noise sensitive activities.

6.3 This approach, while suitable for airports and busy aerodromes is not considered appropriate to apply to the Glenorchy airstrip. The noise effects are quite confined owing to the aircraft types (fixed wing "GA" aircraft, microlights and helicopters) and numbers of flights. The averaging provisions of NZS68905:1992, being based on averaging noise over 90 day periods, would allow for an intolerable amount of noise at the Glenorchy Airstrip on some days on the basis it would be quiet on other days. In the case of high amenity noise environment at the Glenorchy area, I recommend a daily cap on noise events so that on no single day do the residents (or visitors) have to experience inappropriately high levels of aircraft activity, far above the recommended cap on movements.

6.4 In addition, the noise effects I describe above are also exacerbated by the selected flight track. In the case of fixed wing tourist operators and helicopter operators, these type of uses cause intermittent noise that can be mitigated by duration and by the pilot avoiding flying near to residential sites. I understand this is not the case with the tandem hang gliding operation.

7. RECOMMENDED NOISE CONTROLS

7.1 I recommend noise controls be developed for the use of Glenorchy Airstrip based on the following criteria:

- (a) All aircraft shall operate in accordance with an approved **Noise Management Plan**. This Plan should be mandated by a condition on the designation and should be drafted under the authorship of Council with input from the relevant resident associations, airstrip operators, and QAC.
 - (b) The Noise Management Plan should set out, among other things, approved flight tracks that take account of weather and aviation safety matters and importantly avoid flying over residential sites (or sites approved for residential buildings)
 - (c) The level of aircraft activity be restricted within the Noise Management Plan that allows continued use of the Airstrip (at the level considered appropriate in the Reserve Management Plan) but caps daily aircraft movements so that daily aircraft noise is calculated to result in not more than Ldn 55 dB at the closest approved building platform within the Wyuna Preserve. Different limitations may apply to different aircraft types (e.g. helicopters are able to use flexible flight tracks and avoid overflying – so the numbers may not need to be capped to the same degree). The use of the two different runways may also be a factor to consider when developing daily cap on aircraft movements. I consider that Ldn 55 dB is also consistent with the permitted rule for fixed wing aircraft as provided for in Rule 36.5.13 (notified version of the Proposed District Plan).
 - (d) The use of the airstrip should be for daytime only. This should be retained as a condition on the designation.
 - (e) I recommend there should be no limitation on the use of the Airstrip for aircraft needing to land as an alternative to a planned landing elsewhere, in emergency situations, for civil defence purposes, or for purposes associated with national security.
- 7.2 Noise Management Plans mandated by consent conditions or designations granted under the RMA are an established method for dealing with details of noise management. The Quality Planning website provides an overview of their function and contents¹. Most airports and aerodromes (?) in New Zealand use this approach as a noise management tool, most involving input from the local community representatives and operator representatives. It is important that Council stipulate the membership of the committee that drafts the Plan and ensures the various competing interests are fairly represented.
- 7.3 Although I note the submission by the Wyuna Preserve Residents Association does not specifically request such a Plan, their submission did seek;

¹ <http://www.qualityplanning.org.nz/index.php/planning-tools/air/noise-management-in-mixed-use-urban-environments>

- (a) That there be a “no fly zone” over Wyuna Preserve; and
 - (b) Circulatory flights that originate from, or land at, the Airstrip and have the potential to concentrate noise over the Glenorchy Township or Wyuna Preserve be prohibited.
- 7.4 I consider that these two approaches would be effective in limiting noise effects of the use of the airstrip by the Tandem Hang Gliding & Paragliding (because of the character of the noise effect and the flight tracks from those particular users) and should be given consideration when the Noise Management Plan is drawn up.
- 7.5 With these types of controls in place I believe the effects of aircraft noise would generally be acceptable to the local community who have, to some extent, become used to the operation of the Airstrip. I do however understand that the increased use of the Airstrip for tourism based activities and the tandem hangliding operation have caused noticeable increases in noise, sometimes causing annoyance.
8. **LDN 55 DB**
- 8.1 I would not support a level of use that resulted in daily level of aircraft noise exceeding Ldn 55 dB at the closest dwelling site or approved building platform. The general philosophy is that there are few, if any, adverse effects from aircraft noise below 45 dB Ldn. However at higher levels, say above 60 dB Ldn the adverse effects are generally agreed to be significant. In the 1990's, a researcher, Bradley,² combined the results of a number of aircraft noise annoyance studies, to provide a relationship for community response to airport noise. The resulting graph (**Figure 1 below**), show the various individual airport studies and the overall 'Bradley Mean Trend' for all studies.

² Bradley, J. (1996) “*Determining Acceptable Limits for Aviation Noise,*” *Internoise 96.*

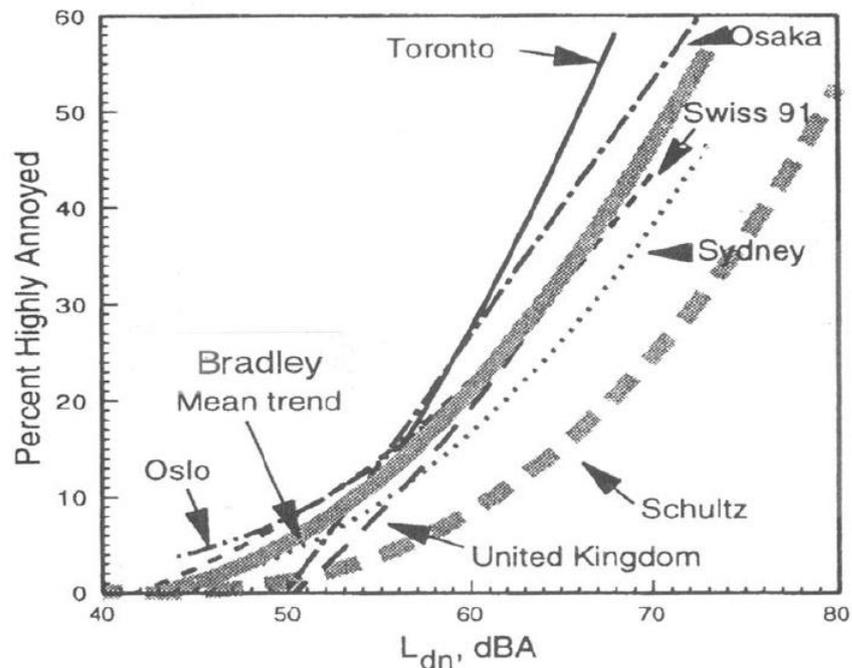


FIGURE 1 Community Response to Aircraft Noise (Bradley. 1996)

- 8.2 This figure shows that even at levels of aircraft noise below L_{dn} 55 dBA, a significant proportion of the exposed population (3% to 12%) may be highly annoyed by daily aircraft noise.
- 8.3 I am aware of the evidence of Mr Chris Day of Marshall Day Acoustics presented to the Christchurch Recovery Plan dated March 2015 which at paragraphs 6.7 and 6.8 states:
- "6.7 For people living in Christchurch, the study shows 10% to 15% of people are highly annoyed in the 50 to 55 dB L_{dn} area. By comparison, the overseas studies show 3% to 12% of the population are highly annoyed in this noise band.
- 6.8 In my opinion, both the Christchurch data and the overseas data confirm that the 50 dBA L_{dn} plus environment is not a sensible location for new residential development (or intensification) if it can be easily avoided."
- 8.4 In accordance with the view of Mr Day, I would not support use of the Glenorchy Airstrip that resulted in daily aircraft noise levels exceeding L_{dn} 55 dB as even at this level aircraft will cause some degree of annoyance in my view.
- 8.5 This is also supported by the findings of another Marshall Day employee, Ms Laura McNeill who was an author of a study³ examining complaints due to noise of aircraft using 'SMART Approaches' to Auckland Airport in November 2012, whereby international long haul aircraft used new approach paths to shorten the approach to the airport to reduce flight time, fuel consumption, and air emissions. This study reported widespread community annoyance to aircraft noise events in areas experiencing daily aircraft noise levels of 40 to

³ Auckland Airport Smart Approach Trial Noise Report Ref: Rp 06 r12a 2005528A dated 3 April 2014.

45 dB Ldn, a very low level of aircraft noise. Thus, there are examples where aircraft noise experienced at levels below Ldn 50 dBA can give rise to complaints and annoyance by those exposed to this sound.

- 8.6 In my view the controls around daily use of the Glenorchy Aerodrome should not result in any existing or approved residential site being exposed to aircraft noise at levels of more than Ldn 55 dBA as this could also give rise to adverse effects on amenity of residents and visitors and detract from the high amenity noise environment within which these properties are based. The proposed limit of Ldn 55 dBA is considered to be an appropriate balance, recognising that there will be some adverse effects on residents, but also recognising the continued use and purpose of the Airstrip.

9. COUNCIL'S APPROACH

- 9.1 In general, I support an approach of cap daily movements however I would question the wisdom of doing so without detailed knowledge of the numbers of current movements and the types of aircraft currently using the airstrip
- 9.2 By arbitrarily capping daily movements to current levels, Council could well be authorising an unacceptable level of aircraft noise (for example, approved building platforms being exposed to aircraft noise at levels above Ldn 55 db or even 65 dB).
- 9.3 If there are no accurate records of daily movements (which I understand is the case), then it is unclear how compliance with the "daily cap" will be able to be enforced.
- 9.4 42. It is my belief that a system based around a Noise Management Plan implemented as a condition of the designation would provide a more appropriate mechanism to manage aircraft activity and therefore noise effects caused by aircraft using the airstrip.

10. MR FERGUSON'S EVIDENCE

- 10.1 I support the evidence of Mr Ferguson on behalf of the Wyuna Preserve Residents Association. Specifically, I support the recommendations he has made for operational controls recommended to be included with this designation for the Glenorchy Airstrip which are detailed at section 11 of Mr Ferguson's evidence. I consider these controls will achieve the intent of controlling noise effects, as set out in my evidence.

CONCLUSION

DATED this 7th day of October 2016

Malcolm Hunt

11. APPENDIX A – QUALIFICATIONS AND EXPERIENCE

1. I hold a Bachelor of Science Degree from Victoria University and a Master of Mechanical Engineering Degree specialising in Acoustics from the University of Canterbury where I completed my thesis on acoustics.
2. I hold other qualifications with respect to the Environmental Health Officer Qualification Regulations 1975, and I also hold a Royal Society of Health Diploma in Noise Control.
3. I am a Full Member of the New Zealand Institute of Environmental Health. I am also a 'Full Member' of the New Zealand Acoustics Society, with a requirement of Full Membership being that I satisfy the requirements in regards to the level of professional qualifications I hold as well experience and continuing professional development. I have held the past position of Vice President of the New Zealand Acoustical Society and Elected Committee Member of the Society.
4. I have been a member of various national and international acoustic standards committees, and expert working groups regarding environmental acoustics, including transportation noise. I have been on a number of past New Zealand Standard's committees for acoustics, including the past New Zealand Standards committees reviewing NZS6801 and NZS6802 [covering the measurement and assessment of environmental noise].
5. In 2010 I was awarded a *Meritorious Award* by Standards New Zealand for involvement in development of New Zealand acoustic standards. I have acted as a noise expert in many Resource Consent Hearings, District Plan Hearings, Environment Court, High Court Hearings and Boards of Inquiry.
6. I have completed the 'Making Good Decisions' courses for Resource Management Act [RMA] Practitioners which provides me with current certification as an RMA Practitioner able to undertake a role as a Commissioner assisting Consent Authorities with RMA decision-making processes.
7. My 25 years' experience in acoustics has mainly comprised assessment of noise-related effects of a wide range of commercial, industrial, transportation, or energy type projects. In many cases I have advised on noise control measures through both engineering methods and management plans. I have assessed noise effects within sensitive receiver sites such as residential sites, aged-care facilities, schools and hospitals. In many projects I have provided advice in relation to appropriate building materials and methods to control the intrusion of outdoor noise sources.
8. I have experience in the technical evaluation of aircraft noise and planning proceedings relating to airport noise. I have been providing noise consultancy advice to Wellington International Airport between 1993 and 2009 and have managed the automated aircraft noise monitoring system in place at this airport until earlier this year. I have also taken manual "hands on" measurements of aircraft noise at a number of airports. I also have experience with the INM noise prediction program.
9. In addition to my work at Wellington International Airport, I have been involved with noise investigations at other airports as follows:
 - Palmerston North Airport
 - Queenstown Regional Airport
 - Gisborne Regional Airport
 - Whangarei Regional Airport
 - Nelson Regional Airport
 - Ardmore Airstrip

- Kaipara Airstrip
- Thames Airfield
- Waipukurau Airfield

10. I also have experience with aircraft noise assessment and design works carried out for the New Zealand Defence Force at Ohakea and Whenuapai Airbases.
11. Regarding Paraparaumu Airport, in 2007 I assisted Kapiti Coast District Council (KCDC) with an independent review of noise and acoustic matters associated with Plan Change 73 (PC 73) which focused on the validity of alternative aircraft noise contours to be adopted into the Operative District Plan to control noise emissions from the airport and which also formed the basis of land use planning controls for sensitive land use activities establishing near the airport.
12. In 2008 I subsequently provided noise and acoustic evidence on behalf of KCDC regarding the appeal of PC 73 (ENV-2008-WLG-103, 126 & 127).