



WHENUAPAI BUSINESS PARK
PRIVATE PLAN CHANGE AIRCRAFT NOISE
PLANNING STANDARDS

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Project: **PROPOSED PRIVATE PLAN CHANGE WHENUAPAI BUSINESS PARK**

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1.0 INTRODUCTION

Neil Construction Ltd (NCL) has asked Marshall Day Acoustics Ltd (MDA) to provide acoustic advice regarding the proposed Private Plan Change (PPC) to rezone an area of land from Future Urban to Business – Light Industry Zone under the Auckland Unitary Plan (AUP). The area to be rezoned would be known as Whenuapai Business Park (WBP).

The PPC comprises an area of approximately 47.5ha and relates to the sites shown in Figure 1 below:

- 69, 71, 73, 94, 96, 96A Trig Road;
- 141, 145, 151, 153, 155, 157 and 159 Brigham Creek Road.

Figure 1: Sites Included in Proposed Private Plan Change for Whenuapai Business Park



The PPC area is located near the Whenuapai Airbase. The western flank of the site is subject to the Whenuapai Airbase Aircraft Noise Overlay (AUP Activity Table D24.4.1 and Standard D24.6.1), see figure 2.

Whilst the noise overlay is the only operative planning standard relating to noise from the Airbase activities, we note that substantial acoustic monitoring and reporting was undertaken as part of (recently withdrawn) Plan Change 5 and Variation 1 to Plan Change 5. The Whenuapai Airbase Engine Testing Noise Overlay (proposed under Variation 1) provides updated noise contours reflective of the 2020 acoustic situation prior to the decommissioning of the P3 Orion aircraft fleet. Whilst this has no statutory weight, the information provides the latest engine testing noise contours updated by the Minister of Defence.

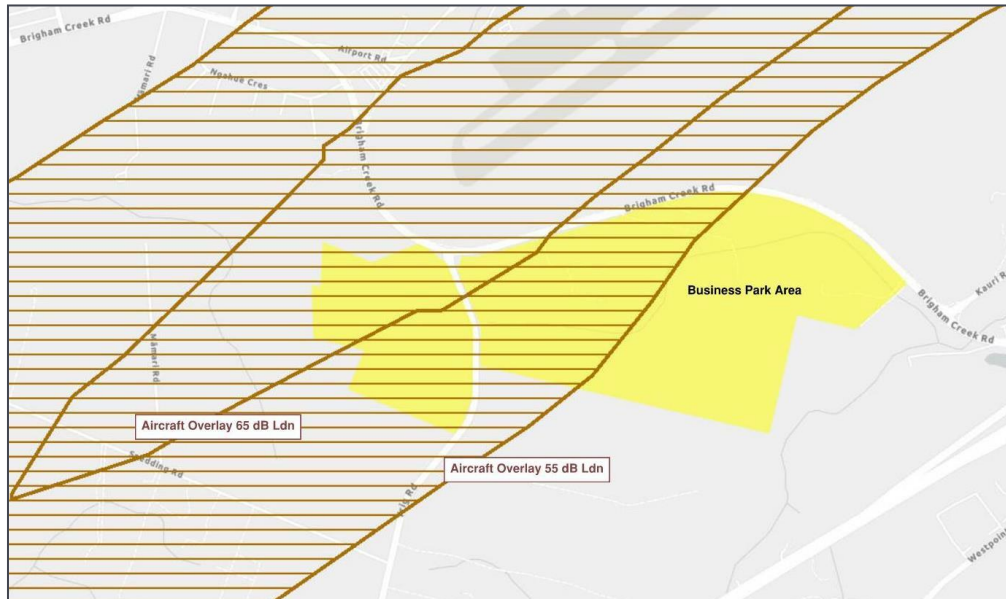
We have been asked by NCL to summarise the Whenuapai Airbase noise related planning standards that may apply to parts of the proposed WBP and to identify the impact of this on the types of activities that may establish in the business park. We have also provided indicative information on how the acoustic insulation standards can be achieved for potential noise sensitive activities establishing within the business park.

2.0 AIRPORT NOISE PLANNING STANDARDS

2.1 The Whenuapai Airbase Aircraft Noise Overlay (AUP Chapter D24)

The Whenuapai Airbase Aircraft Noise Overlay published in the AUP planning maps is shown in Figure 2 below. The overlay consists of two aircraft noise boundaries defined as 55 dB L_{dn} and 65 dB L_{dn} noise boundaries. Parts of the proposed WBP area are located inside the 55 and 65 dB L_{dn} boundaries and are therefore subject to the applicable rules and standards in Chapter D24 of the AUP.

Figure 2: Whenuapai Airbase Aircraft Noise Overlay on Proposed Business Park Area



Activity Table D24.4.1 sets out the activity status applying inside the Whenuapai Airbase Aircraft Noise Overlay. Table D24.4.1 is reproduced below.

Table D24.4.1 Activity table for North Shore Airport, Kaipara Flats Airfield and Whenuapai Airbase

Activity		Activity status
Development between the 55dB L_{dn} and 65dB L_{dn} noise boundaries (including Lot 3 DP 104718)		
(A1)	New activities sensitive to aircraft noise	RD
(A2)	New activities sensitive to aircraft noise that do not comply with Standard D24.6.1(1)	NC
(A3)	Alterations or additions to existing buildings accommodating activities sensitive to aircraft noise	RD
(A4)	Alterations or additions to existing buildings accommodating activities sensitive to aircraft noise that do not comply with Standard D24.6.1(1)	NC
Development within the 65dB L_{dn} noise boundary (excluding Lot 3 DP 104718)		
(A5)	New activities sensitive to aircraft noise	Pr
(A6)	Alterations or additions to existing buildings accommodating activities sensitive to aircraft noise	NC
Subdivision		
(A7)	Subdivision of land for activities sensitive to aircraft noise to create a new site within the 65dB L _{dn} noise boundary	Pr
(A8)	Subdivision of land for activities sensitive to aircraft noise to create a new site between the 55dB L _{dn} and 65dB L _{dn} noise boundaries	NC

For the area of the proposed business park inside the 65 dB L_{dn} noise boundary, new **activities sensitive to aircraft noise** are prohibited and alterations and additions to buildings accommodating existing **activities sensitive to aircraft noise** are non-complying.

For the area of the proposed business park between the 55 and 65 dB L_{dn} noise boundaries, new activities sensitive to aircraft noise and alterations and additions to existing buildings accommodating **activities sensitive to aircraft noise** are restricted discretionary activities provided they meet the acoustic insulation and ventilation standard D24.6.1.

Even if standard D24.6.1 is met, a resource consent is required, and the Council's discretion is restricted to the following matters:

- The internal noise environment of the proposed and any existing structure;
- The internal ventilation standards for the proposed or any existing structure;
- Measures for or relating to the attenuation of aircraft noise arising in connection with the airbase;
- The imposition of an obligation to ensure any required acoustic treatment measures are not removed without the Council's consent, including requiring the obligation to be registered on the certificate of title; and
- The nature, size and scale of the proposed development.

The definition of activities sensitive to aircraft noise is set out in Chapter J of the AUP as follows:

Activities sensitive to aircraft noise

Any dwellings, boarding houses, marae, papakainga, integrated residential development, retirement villages, supported residential care, care centres, education facilities, tertiary education facilities, hospitals, and healthcare facilities with an overnight stay facility.

Marae is included in the definition of community facilities in Chapter J. Care centre is defined in Chapter J as follows:

Care centre

Facility used for any one or more of the following:

- *Children, in addition to the children of the person in charge, aged six years or younger are educated and cared for, and includes: childcare centres, creches, kindergartens, kohanga reo, playcentres and play groups;*
- *Early childhood learning services;*
- *Children in addition to the children of the person in charge, aged five years or older and are cared for out of school hours;*
- *Elderly people are cared for during the day; and*
- *People with disabilities (including mental health, addiction, illness or intellectual disabilities) are cared for during the day.*

The acoustic insulation and ventilation standard D24.6.1 that applies in the Whenuapai Airbase Aircraft Noise Overlay requires the following:

D24.6.1 North Shore Airport, Kaipara Flats, and Whenuapai

(1) The following activities:

- *D24.4.1(A1) New activities sensitive to aircraft noise; and*
- *D24.4.1(A3) Alterations or additions to existing buildings accommodating activities sensitive to aircraft noise*

must provide sound attenuation and related ventilation and/or air conditioning measures:

- a. To ensure the internal noise environment of habitable rooms does not exceed a maximum noise level of 40 dB L_{dn} ;
- b. That are certified by a person suitably qualified and experienced in acoustics to the Council's satisfaction prior to its construction; and
- c. So that the related ventilation and/or air conditioning system(s) satisfies the requirements of New Zealand Building Code Rule G4 with all external doors of the building and all windows of the habitable rooms closed.

The AUP definition of habitable room is provided in Section 4 of this report. **It does not include warehouses, offices, associated amenities and the like.**

2.2 Plan Change 5 Whenuapai Airbase Engine Testing Noise Contours

NCL has asked MDA to address the impact of potential future planning standards relating to Whenuapai Airbase engine testing noise contours proposed in Plan Change 5 Variation 1 (PC5 Var1)¹.

Plan Change 5 was withdrawn on 16 June 2022, nonetheless NCL has asked that we address the proposed provisions in PC5 Var1 with respect to the WBP. These provisions are not operative therefore this summary is provided as supplementary information only.

The proposed engine testing noise contours from Variation 1 are shown in Appendix B. Figure 3 below shows the location of these contours over the WBP. The northern third of the Business Park is between the 57 and 65 dB L_{dn} engine testing noise contours.

Figure 3: Plan Change 5 Var 1 Engine Testing Noise Contours Relative to Whenuapai Business Park Site



The proposed provisions relating to the engine testing noise contours in PC5 Var1 set out that new activities sensitive to aircraft noise within the 65 dB L_{dn} noise boundary were to be prohibited. This does not affect WBP.

¹ Engine testing contours presented in Tonkin and Taylor report "Whenuapai Airbase – Engine Testing Noise Contours Plan Change 5" dated March 2021.

For activities sensitive to aircraft noise between the 57 and 65 dB L_{dn} contour, an acoustic insulation and ventilation standard applies and activities that do not meet this standard are non-complying. The acoustic and ventilation requirements were as follows:

1616.6.10 Development within the aircraft engine testing noise boundaries

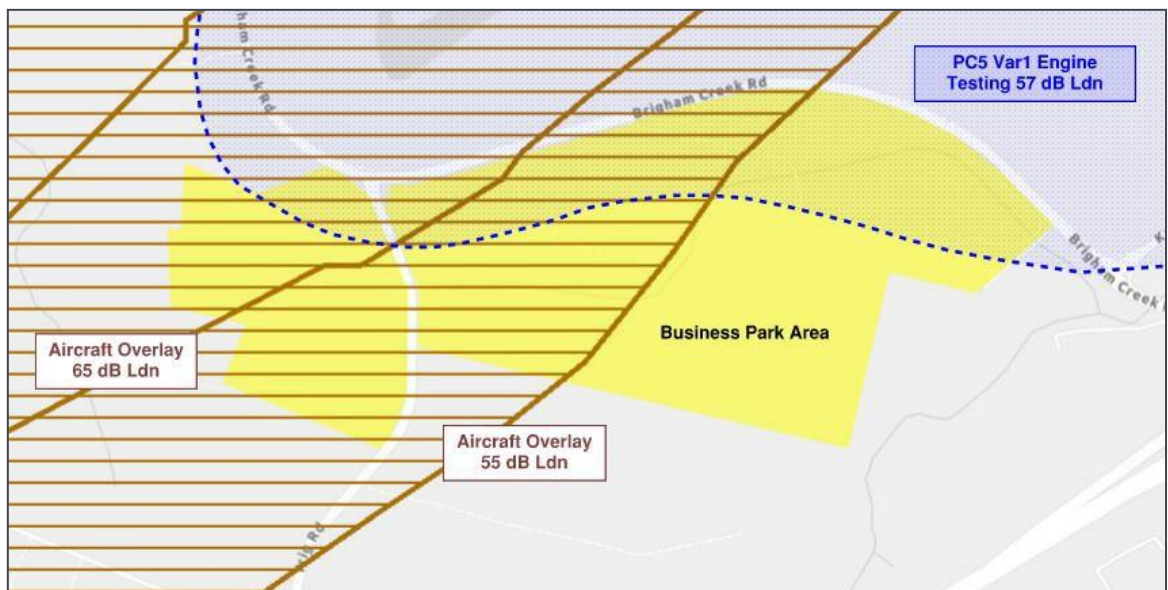
1. *Between the 57 dB L_{dn} and 65 dB L_{dn} noise boundaries as shown on Whenuapai 3 Precinct Plan 3, new activities sensitive to noise and alterations and additions to existing buildings accommodating activities sensitive to aircraft noise must provide sound attenuation and related ventilation and/or air conditioning measures:*
 - a. *To ensure the internal noise environment of habitable rooms does not exceed a maximum noise level of 40 dB L_{dn};*
 - b. *That are certified to the council's satisfaction as being able to meet the Standard 1616.6.10(1)(a) by a person suitably qualified and experienced in acoustics prior to its construction; and*
 - c. *So that the related ventilation and/or air conditioning system(s) satisfies the requirements of New Zealand Building Code Rule G4 with all external doors of the building and all windows of the habitable rooms closed.*

This is the same performance standard that applies between 55 and 65 dB L_{dn} for the Whenuapai Airbase Aircraft Noise Overlay.

3.0 IMPACT OF AIRCRAFT NOISE PLANNING CONTROLS ON WHENUAPAI BUSINESS PARK ACTIVITIES

Figure 4 indicates which areas of the Business Park would be affected by the 65, 55 and 57 dB L_{dn} noise boundaries and associated planning controls. The engine testing contour in Figure 4 has been sketched and is therefore indicative only. The business park area inside the engine testing boundary is shaded blue. The brown hatching identifies the area of the business park inside the Aircraft Noise Overlay.

Figure 4: Aircraft and Engine Testing Noise Boundaries Over Whenuapai Business Park



NCL proposes to apply the AUP **Business – Light Industry Zone (LIZ)** to the WBP. The zone provides for a range of light industrial type activities, and the rules also identify the types of activities that are not anticipated or provided for in the zone (refer AUP Activity Table H17.4.1 in Appendix C). Some of the activities that are not provided for in the zone, overlap with **activities sensitive to aircraft noise**.

Table 1 overpage lists activities sensitive to aircraft noise, grouped by their activity status under the LIZ. This identifies which activities sensitive to aircraft noise are provided for and hence might establish in the WBP.

The third and fourth columns in the table lists the activity status under the operative Aircraft Noise Overlay rules. The final column lists the activity status under proposed PC5 Var1.

The orange shaded activities are not anticipated or provided for in the LIZ and therefore are unlikely to establish within the business park. The green shaded activities are provided for in the proposed zone and therefore might establish within the business park.

The summary, the activities sensitive to aircraft noise that might establish in WBP include:

- Worker's accommodation
- Tertiary education facilities
- Care centres
- Hospitals

These activities would not be permitted inside the 65 dB L_{dn} Whenuapai Airbase Aircraft Noise Overlay (refer Figure 4). If any of these activities were to establish between the 55 and 65 dB L_{dn} Aircraft Noise Overlay, they would require resource consent as a restricted discretionary activity and habitable rooms would be subject to the acoustic insulation and ventilation standard D24.6.1(1).

If the PC5 Var1 provisions did become operative at some point in the future, these activities establishing inside the engine testing 57 dB L_{dn} boundary (refer Figure 4) would be permitted and subject to acoustic insulation and ventilation standard I616.6.10.

We understand that NCL intends to apply a precinct to the WBP plan change area, and that part of the precinct provisions will effectively replicate the Aircraft Noise Overlay provisions to manage the effects of engine testing noise. The precinct provisions would ensure that activities sensitive to aircraft noise could not be established as a permitted activity, and any such activities that were established would need to achieve an acoustic insulation and ventilation standard. We support this proposed approach in the precinct provisions.

Table 1: Summary of Activities and Status by Zone and Aircraft Noise Overlay

Activities sensitive to aircraft noise	Activity Status in Business - Light Industry Zone	Activity Status in Whenuapai Airbase Noise Overlay (55 – 65 dB L _{dn})	Activity Status in Whenuapai Airbase Noise Overlay (>65 dB L _{dn})	Activity Status in PC5 Var1 Engine Testing Noise Boundaries (57 – 65 dB L _{dn})
Worker’s accommodation (1 per site), tertiary education facilities accessory to an industrial activity on the site.	Permitted	Restricted Discretionary if compliant with acoustic insulation & ventilation standard D24.6.1(1)	Prohibited (New)	Permitted if compliant with acoustic insulation & ventilation standard I616.6.10
Care centres, hospitals, tertiary education facilities not otherwise provided for.	Discretionary	Restricted Discretionary if compliant with acoustic insulation standard D24.6.1(1)	Prohibited (New)	Permitted if compliant with acoustic insulation & ventilation standard I616.6.10
Community facilities (includes marae) exceeding 450m ² , dwellings, integrated residential development.	Non-Complying	Restricted Discretionary if compliant with acoustic insulation standard D24.6.1(1)	Prohibited (New)	Permitted if compliant with acoustic insulation & ventilation standard I616.6.10
Boarding houses, papakainga, retirement villages, supported residential care, education facilities, healthcare facilities with an overnight stay facility.	Not provided for (Non-Complying)	Restricted Discretionary if compliant with acoustic insulation standard D24.6.1(1)	Prohibited (New)	Permitted if compliant with acoustic insulation & ventilation standard I616.6.10

4.0 INDICATIVE ACOUSTIC INSULATION MEASURES

The acoustic insulation standards D24.6.1(1) and I616.6.10 require buildings to be designed to ensure an internal noise environment in habitable rooms of not greater than 40 dB L_{dn} based on the outdoor aircraft noise defined at the site by the aircraft and engine testing noise boundaries.

Chapter J of AUP defines habitable rooms as follows:

Habitable room

Any room in a building used for a residential nesting table activity and in a care centre or healthcare facility with an overnight stay facility, excluding laundry, bathroom, toilet or any room used solely as an entrance hall, passageway, garage, or other space of a specialised nature occupied neither frequently nor for extended periods.

For sites within the Aircraft Noise Overlay, the outdoor noise levels range from 55 to 65 dB L_{dn} (Note that noise sensitive activities are not permitted inside 65 dB L_{dn}). To achieve an indoor level of 40 dB L_{dn} a noise reduction of 15 to 25 dB would be required.

For sites within the PC5 Var1 engine testing boundaries, the outdoor noise levels range from 57 to 61 dB L_{dn} (using linear interpolation between boundaries). To achieve an indoor level of 40 dB L_{dn} a noise reduction of 17 to 21 dB would be required.

An outside to inside noise reduction of 25 dB is generally achievable for new buildings without additional acoustic insulation treatment for typical timber or steel frame cavity construction consisting of:

- solid cladding/roofing;
- standard thermal cavity insulation
- internally lined walls and ceilings; and
- closable windows (no passive ventilation or louvres).

However, this depends on the geometry and specific construction of the habitable spaces therefore each building design would need to be assessed individually. Ventilation measures are also required under standards D24.6.1(1) and I616.6.10. MDA is not able to advise on ventilation measures.

Within the Aircraft Noise Overlay, a resource consent would be required with Council's discretion restricted to the matters in AUP D24.8.2. As part of a future resource consent application for an activity sensitive to aircraft noise, we recommend that consideration is given to potential outdoor noise effects from activities at Whenuapai Airbase. In particular, the outdoors noise effects on early childhood education and care centres.

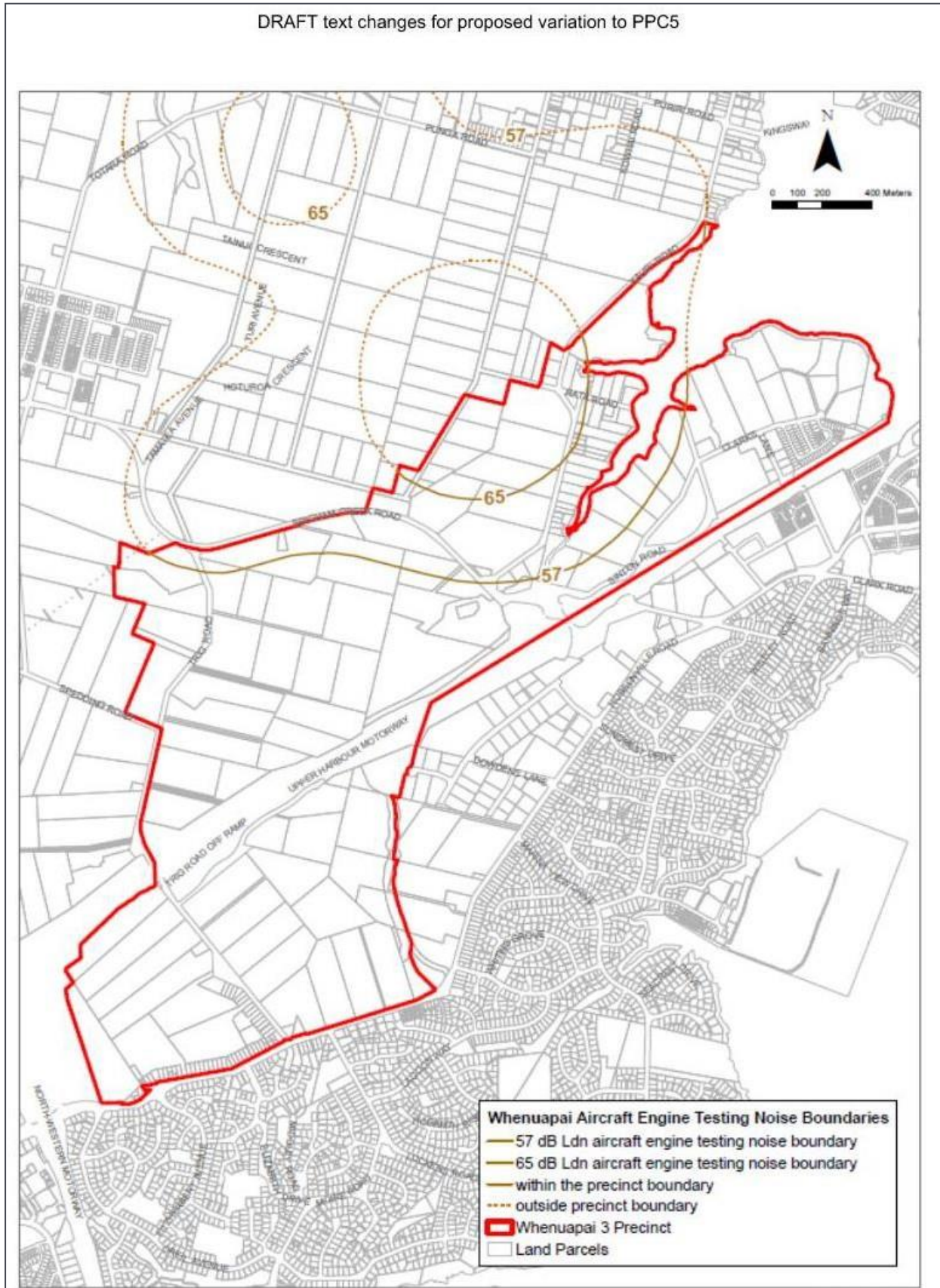
5 CONCLUSION

From an acoustics and noise effects perspective, we consider the proposed rezoning of the plan change area to Business – Light Industrial zone is appropriate. The small number of distinct activities sensitive to aircraft noise that could establish in areas within the Whenuapai Airbase Aircraft Noise Overlay will be required to obtain resource consent and achieve an acoustic and ventilation standard. This will ensure the any specific acoustic or reverse sensitivity effects of such developments are considered on a case-by-case basis. The proposed precinct provisions would ensure these measures also apply to areas in the WBP that are potentially affected by engine testing noise. We consider this is a suitable approach.

APPENDIX A GLOSSARY OF TERMINOLOGY

dB	<p><u>Decibel</u> The unit of sound level.</p> <p>Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$</p>
A-weighting	<p>The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.</p>
$L_{Aeq(t)}$	<p>The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.</p> <p>The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.</p>
L_{Amax}	<p>The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.</p>
L_{dn}	<p>The A-weighted day night noise level which is calculated from the 24 hour L_{Aeq} with a 10 dB penalty applied to the night-time (2200-0700 hours) L_{Aeq}. L_{dn} is a measure of the cumulative noise exposure over time.</p>
NZS 6805:1992	<p>New Zealand Standard NZS 6805:1992 <i>"Airport Noise Management and Land Use Planning"</i></p>

APPENDIX B PLAN CHANGE 5 VARIATION 1 ENGINE TESTING CONTOURS



APPENDIX C AUP BUSINESS – LIGHT INDUSTRY ZONE ACTIVITY TABLE

Table H17.4.1 Activity table

Activity		Activity status
Use		
(A1)	Activities not provided for	NC
Accommodation		
(A2)	Workers accommodation - one per site	P
(A3)	Dwellings	NC
(A4)	Integrated residential development	NC
Commerce		
(A5)	Commercial services	D
(A6)	Dairies up to 100m ² gross floor area	P
(A7)	Drive-through restaurant	P
(A8)	Entertainment facilities	D
(A9)	Food and beverage up to 120m ² gross floor area per site	P
(A10)	Garden centres other than in H17.4.1(A11)	P
(A11)	Garden centres within 100m of a Business – Heavy Industry Zone	RD
(A12)	Motor vehicle sales other than in H17.4.1(A13)	P
(A13)	Motor vehicle sales within 100m of a Business – Heavy Industry Zone	RD
(A14)	Marine retail other than in H17.4.1(A15)	P
(A15)	Marine retail within 100m of a Business – Heavy Industry Zone	RD
(A16)	Offices up to 100m ² gross floor area per site	RD
(A17)	Offices that are accessory to the primary activity on the site and: (a) the office gross floor area does not exceed 30 per cent of all buildings on the site; or (b) the office gross floor area does not exceed 100m ²	P
(A18)	Offices that are accessory to the primary activity on the site and the office gross floor area exceeds 30 per cent of all buildings on the site	RD

(A19)	Offices not otherwise provided for	NC
(A20)	Retail accessory to an industrial activity on the site, where the goods sold are manufactured on site and the retail gross floor area does not exceed 10 per cent of all buildings on the site	P
(A21)	Retail not otherwise provided for	NC
(A22)	Service stations	P
(A23)	Show homes	P
(A24)	Trade suppliers	P
Community		
(A25)	Care centres	D
(A26)	Community facilities up to 450m ² per site	D
(A27)	Community facilities exceeding 450m ² per site	NC
(A28)	Emergency services	P
(A29)	Hospitals	D
(A30)	Recreation facilities	D
(A31)	Tertiary education facilities that are accessory to an industrial activity on the site	P
(A32)	Tertiary education facilities not otherwise provided for	D
Industry		
(A33)	Industrial activities	P
(A34)	Wholesaler	P
(A35)	Storage and lock-up facilities	P
Rural		
(A36)	Animal breeding or boarding	P
(A37)	Horticulture	P
Development		
(A38)	New buildings	P
(A39)	Additions and alterations to buildings	P
(A40)	Demolition of buildings	P