



MARSHALL DAY
Acoustics 

TITANIUM PARK - NORTHERN PRECINCT
PRIVATE PLAN CHANGE

Rp 001 r01 20210716 | 9 March 2022

Project: TITANIUM PARK NORTHERN PRECINCT

Prepared for: Greenstone Group
3 Caro St
Hamilton 3204

Attention: Rob Dol

Report No.: Rp 001 r01 20210716

Disclaimer

Reports produced by Marshall Day Acoustics Limited are based on a specific scope, conditions and limitations, as agreed between Marshall Day Acoustics and the Client. Information and/or report(s) prepared by Marshall Day Acoustics may not be suitable for uses other than the specific project. No parties other than the Client should use any information and/or report(s) without first conferring with Marshall Day Acoustics.

The advice given herein is for acoustic purposes only. Relevant authorities and experts should be consulted with regard to compliance with regulations or requirements governing areas other than acoustics.

Copyright

The concepts and information contained in this document are the property of Marshall Day Acoustics Limited. Use or copying of this document in whole or in part without the written permission of Marshall Day Acoustics constitutes an infringement of copyright. Information shall not be assigned to a third party without prior consent.

Document Control

Status:	Rev:	Comments	Date:	Author:	Reviewer:
Issued		For client feedback	4 March 2022	J. Bell-Booth	M. Cottle
Issued	01	Incorporate comments	9 March 2022	J. Bell-Booth	M. Cottle

TABLE OF CONTENTS

1.0	REPORT SUMMARY AND CONCLUSIONS.....	4
2.0	PLAN CHANGE LOCATION AND DESCRIPTION	4
2.1	The applicant seeks a Plan Change from Rural to Airport Business Zoning.....	4
2.2	The Site is currently a mix of Rural and Airport Business Zones	6
2.3	The Airport, State Highway 3, Rural Zone, and the Southern Links neighbour the Site	7
3.0	EXISTING NOISE ENVIRONMENT	7
3.1	Aircraft are a considerable source of noise in the area	7
3.2	The Southern Links will introduce more traffic noise to the neighbouring Rural properties	7
3.3	The Airport and the local roads create an active area with associated noise.....	8
4.0	A SUMMARY OF NOISE PERFORMANCE STANDARDS.....	9
4.1	Section 4 of the Plan has rules for noise received at Rural zoned dwellings	9
4.1.1	There are rules for noise from other Rural zoned sites – with some exceptions.....	9
4.1.2	There are noise and vibration rules for various other specifically anticipated activities.....	9
4.1.3	Airport noise is controlled by rules in Section 4 too.....	9
4.1.4	There are rules for noise mitigation within the OCB, ANB and SEL 95 Boundary	10
4.1.5	All these rules acknowledge the Rural zone can be noisy.....	10
4.2	Section 10 of the Plan has rules for noise from Airport Business Zones	10
4.2.1	There are rules for noise received at Airport Business Zone and Rural zoned sites	10
4.2.2	There are rules for noise from aircraft and engine testing	10
4.2.3	There are rules for noise mitigation within the OCB, ANB and SEL.....	11
4.2.4	There are construction noise rules and vibration rules.....	11
4.3	The Plan’s noise performance standards in Sections 4 &10 are generally appropriate	11
4.3.1	The performance standards in both Sections have some minor shortcomings.....	11
4.3.2	Rectifying the shortcomings is beyond the scope of this Private Plan Change	12
5.0	PROPOSED NOISE PERFORMANCE STANDARDS.....	12
5.1	The proposed Plan Change is moving the interface of two existing zones.....	12
5.1.1	A small amendment to Rule 10.4.2.15 is proposed – to recognise 141 Middle Road	12
6.0	ASSESSMENT OF NOISE EFFECTS.....	13
APPENDIX A GLOSSARY OF TERMINOLOGY		
APPENDIX B WAIPA DISTRICT PLAN - SECTION 4 - NOISE RULE EXCERPT		
APPENDIX C WAIPA DISTRICT PLAN - SECTION 10 - NOISE RULE EXCERPT		

1.0 REPORT SUMMARY AND CONCLUSIONS

For the proposed Plan Change, including in the context of a changing (increasing) noise environment, we consider the potential for noise effects from and on the activities provided for by the Plan Change is of little appreciable significance.

The applicant seeks to rezone approximately 132 hectares of agricultural land (the Site) adjacent to Hamilton airport from a mixture of Airport Business Zone and Rural to all Airport Business Zone.

The Site is neighboured by Hamilton airport (the airport) and other Rural zoned land. SH3 and the designation for the Southern Links are nearby. Some of the Site (41 hectares) is already zoned Airport Business with the other roughly 92 hectares rural.

Essentially, the Plan Change would move the existing interface of the Rural and Airport Business Zones.

The applicant owns all of the properties that would become Airport Business under the proposed Plan Change – except 208 Narrows Road and 141 Middle Road. We note that:

- the applicant has first right of refusal for the nursery on 208 Narrows Road. Waka Kotahi owns the farm which is subject to sell back once the land is surplus to requirement, and
- the applicant is currently negotiating the purchase of 141 Middle Road; this report assumes it is not owned by the applicant.

Quantification of the existing noise environment has not been possible due to COVID-19 restrictions. However, we consider that:

- The area is developmentally and operationally active
- Road and aircraft are likely to be the predominant noise sources in the area, and
- The construction and operation of the Southern Links is anticipated to increase noise in the area.

We have reviewed the existing performance standards for these zones. We consider the noise provisions for each are generally appropriate. We propose adopting the existing zone provisions for the proposed Plan Change with one small addition to the Airport Business Zone rules; to accommodate 141 Middle Road. The plan rules, with the proposed addition, allow for the proposed activities to occur whilst ensuring that the adverse effects of noise are avoided, remedied, or mitigated.

In the context of an anticipated changing (increasing) noise environment, we consider the potential for noise effects from the Plan Change is of little appreciable significance.

2.0 PLAN CHANGE LOCATION AND DESCRIPTION

2.1 The applicant seeks a Plan Change from Rural to Airport Business Zoning

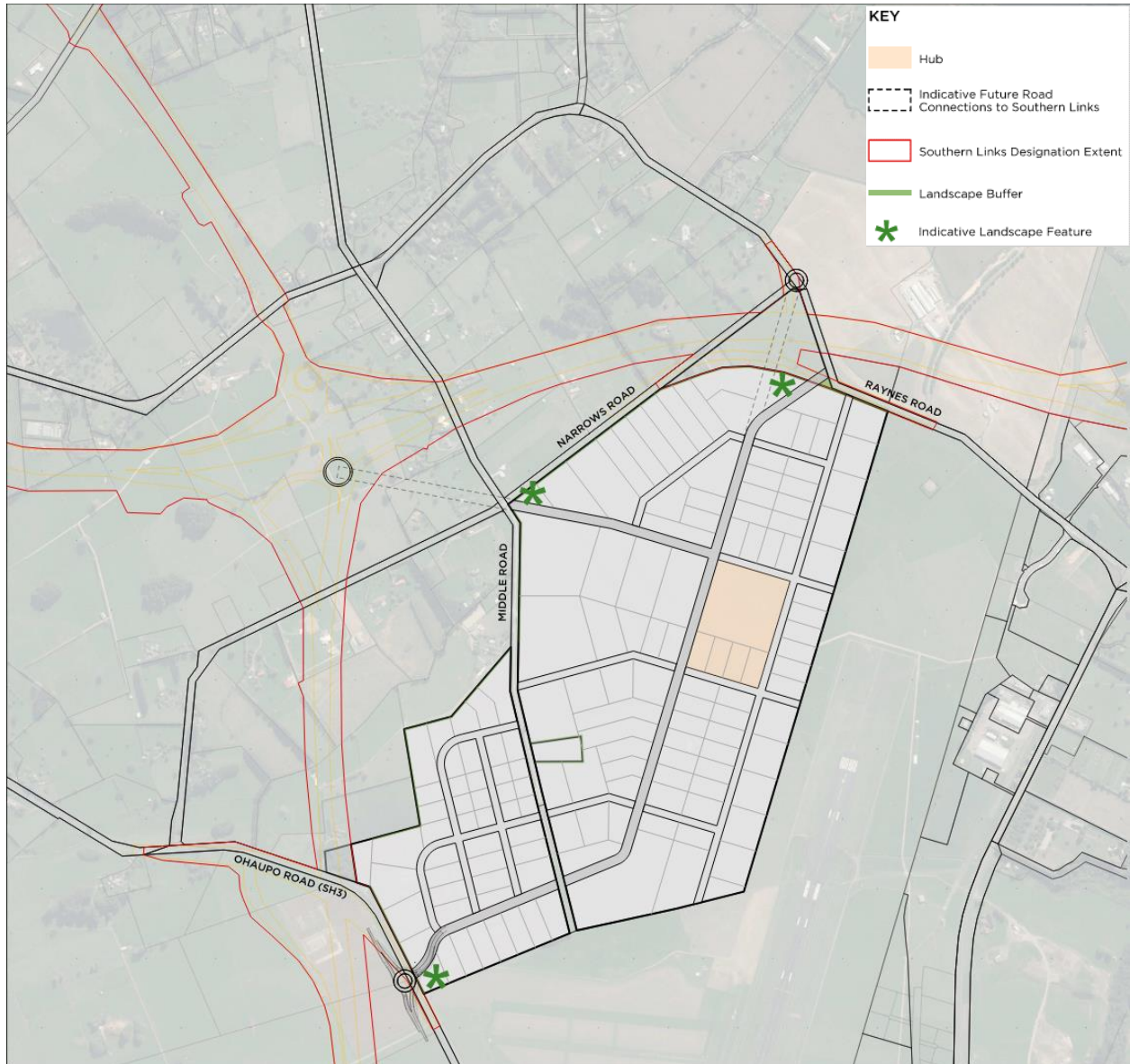
The applicant seeks to rezone 132.4 hectares of agricultural land adjacent to the airport.

The Plan Change area (the Site) is identified as a potential development node and enhanced employment area in the Hamilton Waikato metropolitan spatial plan.

The Site and its neighbours are all located within Waipa District. The zoning would change from Rural zone to Airport Business Zone via a Private Plan Change to the Waipa District Plan (the Plan).

The proposed Southern Links motorway is north of the Site, but it does not pass through areas of the current rural land proposed for re-zoning. With respect to other transport corridors, the Waikato Expressway is further to the east and a rail link is possible to the west.

Figure 1: proposed Plan Change area (the Site)



2.2 The Site is currently a mix of Rural and Airport Business Zones

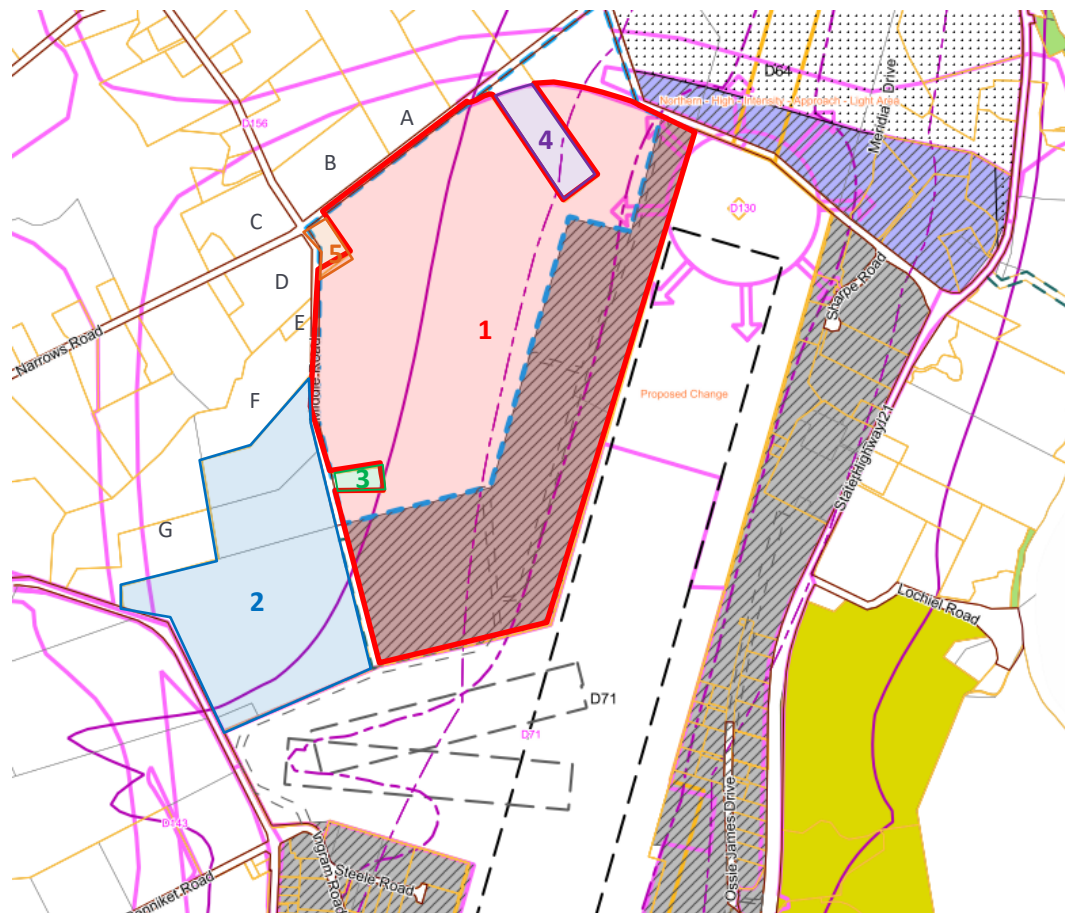
Roughly two-thirds of the Site (92.4 hectares) is presently zoned Rural in the Plan. The remainder (40 hectares) is already zoned Airport Business.

The Site consists of five properties. Table 1 and Figure 2 describe the properties and their current zoning.

Table 1: Properties which make up the Site and their current zoning

Identifier (refer Figure 2)	Address	Legal Description	Zone
1	188 Narrows Road	LOT 1 DP 306726 AND LOT 5 DP 307815 BLKS VI VII HAMILTON SD	Airport Business & Rural
2	3463 Ohaupo Road	LOTS 8 9 DPS 13667 ALLOT 153 TE RAPA PSH BLK VI HAMILTON SD	Rural
3	141 Middle Road	LOT 1 DPS 60613	Rural
4	208 Narrows Road	LOT 1 DPS 35045	Rural
5	77 Middle Road	LOT 1 DPS 89282 BLKS VI VII HAMILTON SD	Rural

Figure 2: Properties which make up the Site (refer Table 2) and its neighbours (refer Table 3)



2.3 The Airport, State Highway 3, Rural Zone, and the Southern Links neighbour the Site

To the south and west the Site borders the Airport (Designation D71). Beyond the Airport designation is Airport Business Zoned land.

The north of the Site is bounded by Raynes and Narrows Roads – whose intersection will likely be re-aligned as part of implementing the Southern Links Designation (Designation D156).

Also, to the north/northwest of the Site; are Rural zoned properties. This group of properties border the Site, Narrows Road and Middle Road and the Southern Links Designation (Designation D156). The properties adjacent to the Site are identified in Figure 1 and Table 2

Table 2: Properties which neighbour the Site

Identifier (refer Figure 2)	Address	Legal Description	Zone
A	175 Narrows Road	LOT 5 DPS 14733 BLK VI HAMILTON SD ILTON SD	Rural
B	67 Middle Road	LOT 4 DPS 14733 BLK VI HAMILTON SD	Rural
C	66 Middle Road	LOT 2 DP 312314	Rural
D	90 Middle Road	LOT 2 DP 490203	Rural
E	92 Middle Road RD	LOT 1 DP 340294 BLK VI HAMILTON SD	Rural
F	108 Middle Road	LOT 2 DP 341857 LOT 2 DP 340294 BLK VI HAMILTON S	Rural
G	3451 Ohaupo Road	LOT 1 DP 341857	Rural

To the west of the Site is State Highway 3 with Rural zoned properties beyond.

3.0 EXISTING NOISE ENVIRONMENT

To date we have not been able to quantify the current acoustic environment with measurements. The noise levels in the area during 2022 would not have been typical due to the COVID-19 Alert Levels and lockdowns. Traffic and aircraft activity would have been abnormal over this period. Nonetheless, it is possible to characterise the environment based on:

- the existing activities that occur in the area, and
- the permitted activities that will contribute to noise in the area.

The noise environment is likely to be largely influenced by aircraft and road traffic.

3.1 Aircraft are a considerable source of noise in the area

Aircraft approaching, departing, and manoeuvring about the airport will form a significant feature of the existing environment. This is anticipated given the proximity to the airport.

Around half of the Site falls under the Outer Control Boundary (OCB). The OCB is the 55 dB L_{dn} noise control boundary for aircraft.

3.2 The Southern Links will introduce more traffic noise to the neighbouring Rural properties

The design of the Southern Links network is not at a stage where detailed information on noise levels is readily available. We are aware that traffic noise from the Southern Links has been modelled. The model was used to illustrate how the noise levels change at various distances from the road. The model used 2041 predicted land use and its associated peak traffic generation. The predicted noise levels from that model are publicly available in the noise poster published for public consultation in

2010¹. An excerpt from the noise poster is reproduced below. The Site is indicated (in red) on the figure. When the Southern Links is constructed, the noise levels in the area will increase.

Figure 3: Excerpt from NZTA noise poster (Site outlined in red)



3.3 The Airport and the local roads create an active area with associated noise

The current noise environment would be typical of a rural area near major arterials and transport infrastructure. The road traffic and airport traffic (including the flight training school) likely dominate the character of the noise environment. The development of the Southern Links will certainly contribute to change (an increase) in noise level when it is in operation.

¹ <https://www.nzta.govt.nz/assets/network/projects/southern-links/docs/road-noise.pdf>

4.0 A SUMMARY OF NOISE PERFORMANCE STANDARDS

Rather than reproduce the rules in our report we provide a summary of the relevant noise performance standards with respect to the Site and its neighbours.

4.1 Section 4 of the Plan has rules for noise received at Rural zoned dwellings

The Plan has noise performance standards in Part D - Zone Provisions - Section 4 - Rural Zone. These are reproduced in Appendix B for reference.

4.1.1 There are rules for noise from other Rural zoned sites – with some exceptions

The noise performance standards in Rule 4.4.2.15 apply to noise from other Rural zoned properties, received at the notional boundary of Rural zone dwellings. In short, the rules are:

- 50 dB L_{Aeq} during the daytime (7am to 10pm)
- 40dB L_{Aeq} & 70 dB L_{Amax} during the night-time (10pm to 7am)

However, several activities are exempt from these limits including:

- farm animals (including farm dogs),
- agricultural vehicles (when not being used for recreational purposes),
- agricultural machinery or equipment (including produce packing facilities where the only produce packed is grown on site)

These exemptions are subject to ‘best practice’ principles such as:

- equipment maintenance,
- accepted management practices and
- adopting the best practicable option to ensure the noise from the activities is reasonable.

4.1.2 There are noise and vibration rules for various other specifically anticipated activities

Section 4 also has noise performance standards for: Mineral extraction (air blast overpressure), Helicopter noise, vibration, construction, bird scaring devices, wind farms, temporary military activities, sound insulation for dwellings close to State Highways and other busy roads and frost fans.

These activities are not anticipated as part of the Plan Change.

4.1.3 Airport noise is controlled by rules in Section 4 too

Rule 4.4.2.28 through 4.4.2.30 set operational noise limits for the airport with some exclusions for engine testing, emergencies, unforeseen circumstances at other airports, and firefighting duties.

Rule 4.4.2.31 through 4.4.2.41 provides rules for noise mitigation to existing dwellings (pre-2011) inside the SEL 95 contour, noise monitoring of aircraft operations and engine testing, keeping a register of aircraft types compliant with SEL 95 boundary, implementing, and maintaining a Noise Management Plan.

Perhaps the most pertinent of these rules is 4.4.2.37 for land use activities within the airport area (excluding engine testing) which are:

- 55 dB L_{A10} during the daytime (7.00am to 9.00pm)
- 45 dB L_{A10} at all other times, and
- 70 dB L_{Amax} during the night-time (10.00pm and 7.00am)

4.1.4 There are rules for noise mitigation within the OCB, ANB and SEL 95 Boundary

Rules 4.4.2.63 through 4.4.2.70 outline:

- the performance standard for internal noise levels for noise sensitive activities that fall inside the OCB, Air Noise Boundary (ANB) and SEL 95 boundary
- the way to determine the noise level incident upon the noise sensitive activity needed to calculate the internal noise level
- the way in which compliance with the rule can be demonstrated, and
- the requirements for thermal comfort and ventilation (and its associated noise), where applicable.

In essence an internal noise level of 40 dBA L_{dn} is required in noise sensitive activities. Noise sensitive activities are defined in the Plan's definitions section. The building's construction must adequately reduce the noise from aircraft to this level. The noise level from aircraft is determined via noise contours within Appendix O10 of the Plan and a spectrum adjustment. Ventilation may be required where doors and windows must remain closed to achieve the internal noise levels. This is required so the occupant can have acoustic amenity, adequate ventilation, and thermal comfort simultaneously.

4.1.5 All these rules acknowledge the Rural zone can be noisy

The noise rules are typical of Rural zones and acknowledge that the zone can be active, busy and productive environments which anticipate noise as a by-product.

4.2 Section 10 of the Plan has rules for noise from Airport Business Zones

The Plan has noise performance standards in Part D - Zone Provisions - Section 10 - Airport Business Zone. These are reproduced in Appendix C for reference.

4.2.1 There are rules for noise received at Airport Business Zone and Rural zoned sites

The noise performance standards in Rule 10.4.2.15 apply to noise from the Airport Business Zone to other Airport Business Zone sites and to the notional boundary of Rural zone dwellings

The rules from the Airport Business Zone to the Rural zone are:

- 55 dB L_{A10} during the daytime (7.00am to 10.00pm) Monday to Saturday
- 45 dB L_{A10} all other times
- 70 dB L_{Amax} during the night-time (10.00pm and 7.00am)

The rules exclude engine testing and noise generated by aircraft in flight taxiing or pre-flight checks.

We note that this is essentially the same as Rule 4.4.2.37 for noise from land use activities within the airport area (excluding engine testing) discussed in section 4.1.3 above.

The rules from the Airport Business Zone to other Airport Business Zone properties are:

- 60 dB L_{A10} at all times
- 70 dB L_{Amax} during the night-time (10.00pm and 7.00am)

Again, the rule excludes engine testing and noise generated by aircraft in flight taxiing or pre-flight checks.

4.2.2 There are rules for noise from aircraft and engine testing

Aircraft and engine testing and some circumstances for exemptions are outlined in Rules 10.4.2.16 through 10.4.2.18.

These rules are the same as those in Section 4 of the Plan.

4.2.3 There are rules for noise mitigation within the OCB, ANB and SEL

Like the Section 4 rules for noise mitigation Rules 10.4.2.19 through 10.4.2.23 outline:

- the performance standard for internal noise levels for noise sensitive activities that fall inside the Outer Control Boundary (OCB), Air Noise Boundary (ANB) and SEL 95 Boundaries
- the way to determine the noise level incident upon the noise sensitive activity needed to calculate the internal noise level
- the way in which compliance with the rule can be demonstrated, and
- the requirements for thermal comfort and ventilation (and its associated noise), where applicable.

The important difference to the Section 4 rules (4.4.2.63 through 4.4.2.70) are:

- noise sensitive activities in the Airport Business Zone are specifically listed in Rule 10.4.2.19, and
- this is acknowledged in the definitions section of the Plan, and
- the internal performance standard for most of these activities (45 dBA L_{dn}) is less stringent, except
- the internal performance standard for new residential activities and visitor accommodation (40 dBA L_{dn}) is the same as the Section 4 rule.

4.2.4 There are construction noise rules and vibration rules

The vibration rule (10.4.2.24) and construction noise rule (10.4.2.25) are the same as those in Section 4 of the Plan.

4.3 The Plan's noise performance standards in Sections 4 & 10 are generally appropriate

The noise rules and limits in Sections 4 and 10 of the Plan:

- acknowledge the likelihood of the types of activities that might occur in each zone, and
- provide appropriate controls for those identified activities.

4.3.1 The performance standards in both Sections have some minor shortcomings

Upon review of both Sections of the Plan we have found the following minor inconsistencies.

L_{Aeq} vs L_{A10} descriptors

Both sections use the L_{A10} parameter despite referencing the latest versions of the relevant standards for noise measurement² and assessment³. The use of the L_{Aeq} parameter (which supersedes L_{A10} parameter used in previous versions of the measurement and assessment standards) better aligns with the latest versions. We note that the L_{Aeq} parameter is used in Rule 4.4.2.15 for noise between Rural zoned sites.

Vibration Standards

The vibration rules in both Sections are not what we consider to be the most relevant or best current practice. The standard referenced pertains to storage, handling and use of explosives. In other

² New Zealand Standard NZS 6801:2008 "Acoustics – Measurement of environmental sound"

³ New Zealand Standard NZS 6802:2008 "Acoustics - Environmental Noise"

districts most District Plans refer to the German Industrial Standard DIN 4150-3:1999 “*Structural Vibration - Effects of Vibration on Structures*” for vibration.

Comparable time periods

There is some small discrepancy in the time periods used.

All the noise rules except Rule 4.4.2.37 (for Land use activities within the airport area – excluding engine testing – to the Rural zone) use a 7.00am to 10.00pm daytime period. Rule 4.4.2.37 uses a 05.00am to 9.00pm daytime period.

All the noise rules except Rule 10.4.2.15 (which apply to noise from the Airport Business Zone to the notional boundary of Rural zone dwellings) apply 7 days a week. Rule 10.4.2.15 applies Monday to Saturday and requires daytime noise limits of 45 dB L_{A10} on a Sunday. A 45 decibel noise limit (L_{Aeq} or L_{A10}) during the daytime is uncommon.

4.3.2 Rectifying the shortcomings is beyond the scope of this Private Plan Change

Despite the identified shortcomings and inconsistencies described above, the rules are understood to achieve the desired outcomes. None of the shortcomings identified represent a problem for the Plan Change.

Amending the rules in both chapters would provide clarity in the future. However, such a change has an impact on numerous parties in each of the zones – across the district. The proposed Plan Change is in a small area relative to the entire Rural and Airport Business Zones.

5.0 PROPOSED NOISE PERFORMANCE STANDARDS

5.1 The proposed Plan Change is moving the interface of two existing zones

The Plan Change proposes to rezone the entire Site as Airport Business Zone and adopt the existing District Plan rules for the zone.

5.1.1 A small amendment to Rule 10.4.2.15 is proposed – to recognise 141 Middle Road

The applicant owns all the properties within the Site, except LOT 1 DPS 60613 (141 Middle Road). This property is identified as ‘3’ in Figure 2.

Under the current zoning and Plan rules the receivers at 141 Middle Road could reasonably expect noise from their Rural zoned neighbours. Noise from these neighbours is permitted at levels up to the Plan’s limits of:

- 50 dB L_{Aeq} during the daytime (7.00am to 10.00pm)
- 40 dB L_{Aeq} & 70 dB L_{Amax} during the night-time (10.00pm to 7.00am)

The receivers at 141 Middle Road could also reasonably expect noise from the nearby Airport Business Zone. Noise from the Airport Business Zone is permitted at levels up to the Plan’s limits of:

- 55 dB L_{A10} during the daytime (7.00am to 10.00pm) Monday to Saturday
- 45 dB L_{A10} all other times
- 70 dB L_{Amax} during the night-time (10.00pm and 7.00am)

Therefore, an amendment to the Airport Business Zone rules is proposed to ensure 141 Middle Road can expect same level of noise that can be reasonably expected presently.

The proposed amendment would apply to Rule 10.4.2.15. and offer the same noise rules that apply to Rural zone receivers from Airport Business Zone activities to 141 Middle Road despite the underlying zone changing to Airport Business.

The proposed amendment is (shown in bold) below:

All activities within the Airport Business Zone, excluding engine testing and noise generated by aircraft in flight taxiing or pre-flight checks, shall be conducted and buildings located, designed and used to ensure the noise levels do not exceed the following limits when measured in accordance with the requirements of NZS 6801:1999 Measurement of Sound and NZS 6802:1991 Assessment of Environmental Sound:

- (a) *Within the boundary or notional boundary of any site zoned Rural and within the boundary of any of the residential properties east of State Highway 3 and identified 'Special Amenity Area' on the Planning Maps and the structure plan at Appendix S10:*
 - (i) *Monday to Saturday 7.00am to 10.00pm 55dBA (L₁₀)*
 - (ii) *At all other times, including public holidays 45dBA (L₁₀)*
- (b) *Within the boundary of any site zoned Airport Business **except LOT 1 DPS 60613 (141 Middle Road)** 60dBA (L₁₀) at all times Provided that no single event noise level L_{max} shall exceed 70dBA at night time 10.00pm to 7.00am.*
- (c) *Within the boundary or notional boundary of **LOT 1 DPS 60613 (141 Middle Road)** :*
 - (i) *Monday to Saturday 7.00am to 10.00pm 55dBA (L₁₀)*
 - (ii) *At all other times, including public holidays 45dBA (L₁₀)*
 - (iii) *Night-time – single noise event 70 dB L_{Amax}*

Prior to any activity being established or building consent being applied for, evidence that these standards will be met may be required by Council.

6.0 ASSESSMENT OF NOISE EFFECTS

The Plan rules allow for the proposed activities to occur whilst ensuring that the adverse effects of noise are avoided, remedied, or mitigated.

The proposed Plan Change would result in a change in the location at which the interface between the Rural and Airport Business zones occurs. As such a change in activity noise levels – as received by some neighbours - is likely to occur.

The neighbours to the Site would be more likely to receive up to the permitted limits 55 dB L_{A10} during the day and 45 dB L_{A10} during the night from the proposed Airport Business Zone. Currently the Rural Zone Provisions limit the noise they receive from Rural zoned neighbours to 50 dB L_{Aeq} during the day and 40 dB L_{Aeq} during the night. It is important to recognize there is a difference between L_{A10} and L_{Aeq} noise parameters. We note that 55 dB L_{A10} from noise sources that are typical of activities in the Airport Business Zone are approximately 52 or 53 dB L_{Aeq}. A 2 to 3 decibel increase in sound is subjective and 'barely perceptible'.

We have not quantified the existing noise levels (due to COVID-19 restrictions) so, we can't objectively compare the existing noise environment to the levels that would be permitted. Nonetheless, the area is anticipated to see a change (increase) in noise levels with the construction and operation of the Southern Links once the designation is implemented. Therefore, the noise levels in the area are anticipated to change (increase) anyway.

The change (increase) in noise levels associated with the proposed Plan Change (and Southern Links, when constructed) will not necessarily result in a change in character. We anticipate that the character of the existing environment, which consists predominantly of road and airport traffic, will continue to be the likely dominant character once the Southern Links is constructed and if the proposed Plan Change is granted.

The Southern Links traffic noise and the activity from the Site will be limited by Plan rules and Designation conditions to reasonable noise levels.

In this situation (including where we are expecting an increase in noise levels, but not entirely due to activity within the proposed Plan Change area), we consider the potential for noise effects from the Plan Change (including the proposed amendments to Rule 10.4.2.15) is of little appreciable significance.

APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	A set of frequency-dependent sound level adjustments that are used to better represent how humans hear sounds. Humans are less sensitive to low and very high frequency sounds.
dB	Decibel. The unit of sound level.
L_{A10}	The A-weighted sound level exceeded for 10% of the measurement period, measured in dB. Commonly referred to as the average maximum noise level.
L_{Aeq}	The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.
L_{Amax}	The A-weighted maximum sound level. The highest sound level which occurs during the measurement period. Usually measured with a fast time-weighting i.e. L _{AFmax}
L_{dn}	The day-night sound level calculated from the measured L _{Aeq} over a 24-hour period with a 10 decibel penalty applied to the night-time period (2200-0700 hours)
Noise	A subjective term used to describe sound that is unwanted by, or distracting to, the receiver.

APPENDIX B WAIPA DISTRICT PLAN – SECTION 4- NOISE RULE EXCERPT

Rule - Noise

4.4.2.15 Noise generating activity other than that from farm animals including farm dogs, agricultural vehicles (when not being used for recreational purposes), agricultural machinery or equipment (including produce packing facilities where the only produce packed is grown on site) operated

and maintained in accordance with the manufacturer's specifications and in accordance with accepted management practices (e.g. for milking, spraying, harvesting, packing and the like, but not including frost fans) and provided that the best practicable option (including the option for the activity to take place at another time of the day), is adopted to ensure that the emission of noise does not exceed a reasonable level; shall be conducted and buildings located, designed and used to ensure that they do not exceed the following limits within the notional boundary of any dwelling (excluding dwellings within mineral extraction sites):

- | | |
|------------------------------------|--------------|
| (a) Day time - 7.00am to 10.00pm | 50dBA (Leq) |
| (b) Night time - 10.00pm to 7.00am | 40dBA (Leq) |
| (c) Night time single noise event | 70dBA (Lmax) |

The noise levels shall be measured and assessed in accordance with the requirements of NZS 6801:2008 – Acoustics – Environmental Sound and assessed in accordance with NZS 6802:2008 – Acoustics – Environmental Noise. Provided that this rule shall not apply to the use or testing of station and vehicle sirens or alarms used by emergency services.

Activities that fail to comply with this rule will require a resource consent for a discretionary activity.

Rule - Mineral extraction air blast over pressure

4.4.2.16 The air blast over pressure from blasting activities within the notional boundary of any dwelling not owned or controlled by the quarry owner or operator undertaking the air blast over pressure blasting activity shall not exceed 115dBA 95 percentile, 120dBL maximum.

Activities that fail to comply with this rule will require a resource consent for a discretionary activity.

Rule - Helicopter noise

4.4.2.17 Helicopter landings and take offs shall be in accordance with NZS6807:1994 Noise Management and Landing Use Planning for Helicopter Landing Areas where there are more than 10 landings per annum.

Advice Note: This rule does not apply to any helicopter movement associated with military or emergency purposes.

Activities that fail to comply with this rule will require a resource consent for a non-complying activity.

Rule - Vibration

- 4.4.2.18 Vibration emanating from a site shall not exceed the limits recommended in and be measured and assessed in accordance with New Zealand Standard NZS 4403:1996 Code of Practice for Storage, Handling, and Use of Explosives.

Activities that fail to comply with this rule will require consent for a restricted discretionary activity, with the discretion being restricted over:

- Safety; and
- Time and duration of effect; and
- Effects on buildings and structures, either on site or on surrounding properties.

These matters will be considered in accordance with the assessment criteria in Section 21.

Rule - Construction noise

- 4.4.2.19 Construction noise emanating from a site shall meet the limits recommended in and be measured and assessed in accordance with New Zealand Standard NZS 6803:1999 Acoustics – Construction Noise.

Activities that fail to comply with this rule will require a resource consent for a restricted discretionary activity with the discretion being restricted over:

- Time and duration of effect; and
- Effects on surrounding properties.

These matters will be considered in accordance with the assessment criteria in Section 21.

Rules - Noise: audible bird scaring devices

- 4.4.2.20 Any audible bird scaring devices shall be operated as follows:

- (a) Only between sunrise and sunset; and
- (b) At a frequency of not more than six clusters of up to three shots from gas operated devices or three multiple shot from firearms in rapid succession per device in any 60 minute period of the day; and
- (c) At a maximum density of one device per 10ha of crop.

- 4.4.2.21 The noise from any bird-scaring device shall not exceed 85dBA unweighted peak level at a Residential Zone boundary or the notional boundary of a dwelling on any Rural Zone property.

Activities that fail to comply with these rules will require a resource consent for a discretionary activity.

Rule - Noise: wind farms

- 4.4.2.22 Wind farm noise shall be managed and measured in accordance with NZS 6808:2010, Acoustics – Wind Farm Noise.

Activities that fail to comply with this rule will require a resource consent for a discretionary activity.

Rules - Noise: temporary military activities

- 4.4.2.23 Noise measured from a line 20m from and parallel to the façade of any dwelling or the legal boundary where this is closest to the dwelling shall not exceed the following limits:

Time (any day)	Noise Limits		
	L10	L95	Lmax
0630 - 0730	60	45a	70
0730 - 1800	75	60	90
1800 - 2000	70	55	85
2000 - 0630 (except as provided for below)	35	-	65
For no more than 5 days in any 4 week period:			
2000 - 0630	40	-	65

- 4.4.2.24 Noise resulting from the use of explosives shall not exceed 122dBA between 6.30am to 8.00pm. No noise resulting from the use of explosives shall be generated outside of these hours.

Advice Note: All noise levels shall be measured and assessed in accordance with the requirements of NZS 6801:2008 – Acoustics – Environmental Sound and assessed in accordance with NZS 6802:2008 – Acoustics – Environmental Noise.

Activities that fail to comply with Rules 4.4.2.23 and 4.4.2.24 will require a resource consent for a restricted discretionary activity with the discretion being restricted over:

- Noise; and
- Vehicle access.

These matters will be considered in accordance with the assessment criteria in Section 21.

Rules - Noise insulation: noise sensitive activities

- 4.4.2.25 Where a noise sensitive activity is proposed to be located within 40m of a railway track, the building shall be insulated so that it achieves the following noise levels:

- | | |
|----------------------------------|-----------------|
| (a) Inside bedrooms | 35dB LAeq (1hr) |
| (b) Inside other habitable rooms | 40dB LAeq (1hr) |

- 4.4.2.26 Where a noise sensitive activity is proposed to be located within:

- (a) 40m of State Highways 1, 1B, 3, 21 and 39 (as measured from the edge of the carriageway) where the posted speed limit is less than 70km/hour; or
- (b) 80m of State Highways 1, 1B, 3, 21 and 39 (as measured from the edge of the carriageway) where the posted speed limit is equal to or greater than 70km/hour; or
- (c) 100m of the Waikato Expressway section of State Highway 1 or any other designated State Highway (as measured from the edge of the carriageway or the edge of the designation if the carriageway location has not been confirmed in writing by the Requiring Authority); or
- (d) The Cambridge North Road Noise Effects Area as identified on the Planning Maps;

then the building shall be insulated so that it achieves the following noise levels:

- | | |
|---|------------------|
| (i) Inside habitable rooms (including bedrooms) | 40dB LAeq (24hr) |
|---|------------------|

- 4.4.2.27 Where a noise sensitive activity is proposed to be located within 40m of a road boundary along Taotaoroa Road, Buckland Road, Karapiro Road or Whitehall Road south of the entrance to Whitehall Quarry, the building shall be insulated so that it achieves the following noise levels:
- | | |
|----------------------------------|-----------|
| (a) Inside bedrooms | 35dBA Leq |
| (b) Inside other habitable rooms | 40dBA Leq |

Advice Note: A report from an experienced practitioner shall be submitted at the time of application to demonstrate compliance with this Rules 4.4.2.25 to 4.4.2.27.

Activities that fail to comply with Rules 4.4.2.25 to 4.4.2.27 will require a resource consent for a discretionary activity.

Rules - Airport noise

- 4.4.2.28 The Hamilton International Airport shall be operated so that the day/night level (Ldn) produced by aircraft operations does not exceed:
- | | |
|---|-------|
| (a) At or outside the ANB as shown on the Planning Maps | 65dBA |
| (b) At or outside the OCB as shown on the Planning Maps | 55dBA |
- 4.4.2.29 The daily Ldn shall be measured in accordance with NZS6805:1992 'Airport Noise Management and Land Use Planning' and shall be logarithmically averaged over a three month period. For the purposes of this rule, aircraft operations shall include aircraft flights, aircraft taking off and landing, and aircraft taxiing, but excludes:
- Aircraft engine testing; and
 - Aircraft landing or taking off in an emergency; and
 - Emergency flights required to rescue persons from life threatening situations or to transport patients, human organs or medical personnel in a medical emergency; and
 - Aircraft using the airport due to unforeseen circumstances as an essential alternative to landing at another scheduled airport; and
 - Aircraft undertaking fire fighting duties.
- 4.4.2.30 The Airport shall be operated so that the Sound Exposure Level (SEL) produced by aircraft operations between 10.00pm and 7.00am shall not exceed SEL 95dBA at or outside the SEL 95 Boundary as shown on the Planning Maps and Appendix O10, excluding those aircraft movements specified in Rule 4.4.2.29(a) to (e).

The SEL shall be measured in accordance with NZS6805:1992 'Airport Noise Management and Land Use Planning'.

Activities that fail to comply with Rules 4.4.2.28 to 4.4.2.30 will require a resource consent for a discretionary activity.

Rules - Airport noise mitigation programme

4.4.2.31 Within the SEL 95 Boundary, where an existing residential activity was lawfully established:

- (a) Before 10 August 2011; or
- (b) A resource consent or building consent for a residential activity was granted before 10 August 2011; and
- (c) Hamilton International Airport proposes to commence scheduled wide body jet operations between 10.00pm and 7.00am on more than three occasions per week;

Then (d) to (f) shall apply:

- (d) The Operator of Hamilton International Airport shall make an offer to the owners to install ("the Offer"), and if the Offer is accepted shall install acoustic treatment and related ventilation measures ("the treatment measures") to achieve an internal acoustic environment in the existing or consented sleeping areas of the buildings (with all external doors of the building and all windows of the habitable rooms closed) of SEL 65dBA provided that no such Offer shall be required in respect of any site owned by the Operator of Hamilton International Airport. The Offer shall include all building consent and certification fees payable to Council. The Offer shall be made not later than two months before the commencement of scheduled wide body jet operations between 10.00pm and 7.00am on more than three occasions per week; and
- (e) The treatment measures shall achieve the standards of acoustical treatment and ventilation set out in Rules 4.4.2.66 to 4.4.2.68; and
- (f) The Offer shall be made on the following basis:
 - (i) Any structural or other changes required under the Building Act or otherwise, to enable the installation of the treatment measures shall be at the expense of the Operator of Hamilton International Airport, except that nothing in this clause shall require the Airport Operator to fund any measures required to bring a building up to the standard required in any building bylaws or any provisions of any statute that applied when the building or relevant part was constructed or to improve the standard of finishes in the building; and
 - (ii) It will remain open for acceptance on a willing participant basis for three years from the date on which it was made after which time the Operator of Hamilton International Airport's obligations under this rule will be deemed to be fulfilled; and
 - (iii) Where the Operator of Hamilton International Airport installs any treatment measures, the Operator shall provide Council with a certificate from a suitably qualified person nominated by the Operator and approved by Council, that the installation of those measures has been properly undertaken in accordance with sound practice.

4.4.2.32 The Operator of Hamilton International Airport shall carry out full time in-field noise monitoring. The noise monitoring shall be carried out in accordance with the Noise Management Plan (NMP) and shall be commenced:

- (a) Within 12 months of this rule becoming operative; or
- (b) Within six months of the third unscheduled engine testing event in any calendar year, whichever of (a) or (b) occurs first.

- 4.4.2.33 Noise from aircraft operations shall be monitored annually for a period of not less than three months (during a busy period of aircraft movements). Monitoring shall demonstrate the noise level at the ANB. The results of the monitoring shall be reported to Council annually.
- 4.4.2.34 Noise from engine testing (scheduled and unscheduled) shall be monitored at all times other than those referred to in Rule 4.4.2.32(b) above and the results shall be reported to Council annually.
- 4.4.2.35 The Operator of Hamilton International Airport shall maintain a register of aircraft types that comply with the SEL 95 Boundary and are therefore permitted to operate between 10.00pm and 7.00am.
- 4.4.2.36 The Operator of Hamilton International Airport shall implement and maintain a Noise Management Plan (NMP). The NMP shall set out the measures to be used by the Operator, subject to Rules 4.4.2.28 to 4.4.2.41 to manage the noise effects of airport operations, aircraft taking off and landing, aircraft carrying out a missed approach for training purposes, circuit training and aircraft taxiing. The NMP shall include but not be limited to the following matters:
- (a) Management of noise emissions at night with particular emphasis on the methods adopted to effectively manage the noise effects of general aviation traffic after 10.00pm; and
 - (b) Procedures for receiving and addressing noise complaints; and
 - (c) Methods for managing the effects of noise caused by scheduled and unscheduled engine testing; and
 - (d) Operation and location of noise monitoring equipment; and
- 4.4.2.37 Land use activities, including the maintenance of aircraft, but excluding engine testing and the operation of aircraft within the Airport area, shall comply with the following:
- (a) The noise level (L10) as measured within the notional boundary of any building used for residential purposes shall not exceed the following limits;

(i) Monday to Sunday - 7.00am to 9.00pm	55dBA
(ii) At all other times	45dBA
 - (b) No single event noise level Lmax shall exceed 70dBA at night time (10.00pm to 7.00am).
- Advice Note: The noise levels shall be measured and assessed in accordance with the requirements of NZS 6801:2008 Acoustics - Measurement of Sound and NZS 6802:2008 Acoustics – Environmental Noise.
- 4.4.2.38 Noise from the testing of aircraft shall not exceed the following noise limits when measured in accordance with the requirements of NZS 6801:2008 Acoustics Measurement of Sound:
- (a) Within the boundary of the residential properties east of SH3 (as identified on Planning Map 19 – Special Amenity Area):

(i) Leqn	50dBA
(ii) Lmax	80dBA
 - (b) Within the notional boundary of any other dwelling:

(i) Leqn	45dBA
(ii) Lmax	75dBA

Leqn is defined as the logarithmic average of the hourly Leqn values from 10.00pm to 7.00am the following day, calculated as a rolling average over the last seven nights.

- 4.4.2.39 Noise from night time engine testing shall be monitored by the Operator to determine the total noise dose from engine testing that has been generated over the last seven days. A summary of these results shall be provided to Council once a year and be available to Council for inspection at any reasonable time and upon reasonable notice.

Advice Note: Monitoring may be undertaken by calculation based on field measurements. The monitoring requirement specified in the above rule will be fully satisfied by the provision of monitoring data provided by the operators of the Hamilton Airport in accordance with Rules 4.4.2.32 to 4.4.2.35.

- 4.4.2.40 Exemptions to undertake engine testing that does not comply with Rule 4.4.2.38 are permitted where:

- (a) There is a requirement to undertake essential unscheduled engine testing between the hours of 10.00pm and 7.00am; or
- (b) The aircraft has a scheduled passenger and/or freight landing at Hamilton International Airport within 18 hours of the engine testing taking place; or
- (c) The engine testing is necessary to return the aircraft to scheduled services as soon as practically possible; or
- (d) The engine testing cannot be completed outside the hours of 10.00pm and 7.00am without disruption to flying schedules.

- 4.4.2.41 Exemptions from Rule 4.4.2.38 are subject to the following conditions:

- (a) The essential unscheduled engine testing must be notified to the Operator of Hamilton International Airport and Council by the aircraft testing operator as soon as the need for it is known; and
- (b) As soon as practically possible after the essential unscheduled engine testing is completed the aircraft testing operator shall send to the Operator of Hamilton International Airport and Council a report which shall include details of the date, time, location, duration, type of aircraft, engine power setting, the reasons for it being an exemption, and proof the aircraft was on a scheduled flight to Hamilton Airport; and
- (c) The Operator of Hamilton International Airport is to maintain a register of any exemptions under this rule, and the register is to be made publicly available; and
- (d) The noise shall not exceed L_{max} 85dBA within the boundary or notional boundary of any dwelling; and
- (e) The cumulative duration of engine running time shall not exceed 30 minutes with a maximum cumulative duration of five minutes at high power settings; and
- (f) The total time from first engine on to last engine off, including any engine off time between run-ups, shall not exceed 90 minutes; and
- (g) The essential unscheduled engine testing must be undertaken in the following locations:
 - (i) The ATR72 aircraft and any others able to be accommodated within the Eagle Air enclosure should be positioned in that run-up noise enclosure; and
 - (ii) All other aircraft are to be positioned on the main runway facing north at the intersection with runway 07-25 (unless weather conditions require the aircraft to be south facing).

- (h) For any aircraft to rely on this exemption it must be either:
 - (i) One of the following aircraft types: Beechcraft 1900D, ATR72, Boeing 737-300, Boeing 737-800; or
 - (ii) Be of a type certified by an acoustic consultant as being able to undertake engine testing in the locations referred to in (g) above and still meet the L_{max} limit in (d) above.

Activities that fail to comply with Rules 4.4.2.31 to 4.4.2.41 will require a resource consent for a discretionary activity, except for scheduled engine testing that exceeds Rule 4.4.2.38 by up to 5dBA which is a restricted discretionary activity refer to Rule 4.4.1.5(e) and scheduled engine testing that exceeds Rule 4.4.1.3(l) which is a non-complying activity.

Rules - Frost fans

- 4.4.2.42 Noise generated by frost fans shall not exceed 55dBA Leq (15mins) when assessed within the notional boundary of a dwelling on any other site in the Rural Zone, or within the site boundary of any Large Lot Residential Zone or Residential Zone.
- 4.4.2.43 Frost fans shall only be operated when the local air temperature drops to, or below 2 degrees centigrade, recorded at a height above ground relevant to the height of the bud or fruit being protected.

Activities that fail to comply with Rules 4.4.2.42 and 4.4.2.43 will require a resource consent for a non-complying activity.

APPENDIX C WAIPA DISTRICT PLAN – SECTION 10- NOISE RULE EXCERPT

Rule - Noise

10.4.2.15 All activities within the Airport Business Zone, excluding engine testing and noise generated by aircraft in flight taxiing or pre-flight checks, shall be conducted and buildings located, designed and used to ensure the noise levels do not exceed the following limits when measured in accordance with the requirements of NZS 6801:1999 Measurement of Sound and NZS 6802:1991 Assessment of Environmental Sound:

- | | | |
|------|--|-------------|
| (a) | Within the boundary or notional boundary of any site zoned Rural and within the boundary of any of the residential properties east of State Highway 3 and identified 'Special Amenity Area' on the Planning Maps and the structure plan at Appendix S10: | |
| (i) | Monday to Saturday 7.00am to 10.00pm | 55dBA (L10) |
| (ii) | At all other times, including public holidays | 45dBA (L10) |
| (b) | Within the boundary of any site zoned Airport Business at all times | 60dBA (L10) |

Provided that no single event noise level Lmax shall exceed 70dBA at night time 10.00pm to 7.00am.

Prior to any activity being established or building consent being applied for, evidence that these standards will be met may be required by Council.

Advice Note: For some common activities it will be sufficient to simply indicate the intended use (e.g. Warehousing); for others, evidence from a suitably qualified person will be required.

Activities that fail to comply with this rule will require a resource consent for a discretionary activity.

Rules - Noise: aircraft and engine testing

10.4.2.16 Noise from the maintenance and testing of aircraft shall not exceed the following noise limits when measured in accordance with the requirements of NZS 6801:1999 Measurement of Sound:

Within the boundary or notional boundary of any site zoned Rural:

- | | | |
|-----|------|-------|
| (a) | Leqn | 45dBA |
| (b) | Lmax | 75dBA |

Within the boundary of any of the residential properties within the Special Amenity Area shown on the Planning Maps and the structure plan at Appendix S10:

- | | | |
|-----|------|-------|
| (c) | Leqn | 50dBA |
| (d) | Lmax | 80dBA |

Leqn is defined as the logarithmic average of the hourly Leqn values from 10.00pm to 7.00am the following day, calculated as a rolling average over the last seven nights. Noise from night time engine testing shall be monitored by the operator to determine the total noise dose from engine testing that has been generated over the last seven days. A summary of these results shall be provided to Council once a year and be available to Council for inspection at any reasonable time and upon reasonable notice.

Advice Note: The monitoring requirement specified in the above rule will be fully satisfied by the provision of monitoring data provided by the operators of the Hamilton Airport in accordance with Rules 4.4.2.31 to 4.4.2.34.

- 10.4.2.17 Exemptions to undertake engine testing that does not comply with Rule 10.4.2.16 are permitted where:
- (a) There is a requirement to undertake essential unscheduled engine testing between the hours of 10.00pm and 7.00am; and
 - (b) The aircraft had a scheduled passenger and/or freight landing at Hamilton Airport within 18 hours of the engine testing taking place; and
 - (c) The engine testing is necessary to return the aircraft to scheduled services, as soon as practically possible; and
 - (d) The engine testing cannot be completed outside the hours of 10.00pm and 7.00am without disruption to flying schedules.
- 10.4.2.18 Exemptions from Rule 10.4.2.16 are subject to the following conditions:
- (a) The essential unscheduled engine testing must be notified to the operator of Hamilton International Airport and Waipa District Council (WDC) by the aircraft testing operator as soon as the need for it is known; and
 - (b) As soon as practically possible after the essential unscheduled engine testing is completed the aircraft testing operator shall send to the operator of Hamilton International Airport and WDC a report which shall include details of the date, time, location, duration, type of aircraft, engine power setting, the reasons for it being an exemption, and proof the aircraft was on a scheduled flight to Hamilton International Airport; and
 - (c) The operator of Hamilton International Airport is to maintain a register of any exemptions under this rule, and the register is to be made publicly available; and
 - (d) The noise shall not exceed L_{max} 85dBA within the boundary or notional boundary of any dwelling; and
 - (e) The cumulative duration of engine running time shall not exceed 30 minutes with a maximum cumulative duration of five minutes at high power settings; and
 - (f) The total time from first engine on to last engine off, including any engine off time between run-ups, shall not exceed 90 minutes; and
 - (g) The essential unscheduled engine testing must be undertaken in the following locations:
 - (i) The ATR72 aircraft and any others able to be accommodated within the Eagle Air enclosure should be positioned in that run-up noise enclosure; and
 - (ii) All other aircraft are to be positioned on the main runway facing north at the intersection with runway 07-25 (unless weather conditions require the aircraft to be south facing); and
 - (h) For any aircraft to be able to rely on this exemption it must be either:
 - (i) One of the following aircraft types: Beechcraft 1900D, ATR-72, Boeing 737-300, Boeing 737-800; or
 - (ii) Be of a type certified by an acoustic consultant as being able to undertake engine testing in the location referred to in (g) above and still meet the L_{max} limit in (d) above.

Activities that fail to comply with Rules 10.4.2.16 to 10.4.2.18 will require a resource consent for a non-complying activity, except for scheduled engine testing that exceeds Rule 10.4.2.16 by up to 5dBA which is a restricted discretionary activity, refer to Rule 10.4.1.3(d).

Rules - Noise mitigation within the OCB, ANB and SEL

10.4.2.19 The following noise sensitive activities located within the OCB, ANB and SEL shall incorporate appropriate acoustic treatment to ensure that a noise level not exceeding 45dBA (Ldn) is achieved inside the building, except that in all habitable rooms of new residential activities and visitor accommodation, including extensions and additions to existing residential activities and visitor accommodation, a noise level not exceeding 40dBA shall be achieved:

Noise Sensitive Activities
Residential activities.
Visitor accommodation.
Education facilities including aviation education training.
Caretakers accommodation ancillary to any other activity.
Childcare facilities.
Healthcare facilities.
Conference facilities.
Places of Assembly.
Offices
Laboratories and research establishments.

10.4.2.20 The internal noise level shall be calculated in accordance with the predicted external level at the subject site shown on the plan at Appendix O10 and in accordance with the following adjustments to the dBA level to establish an unweighted external source spectrum for aircraft noise:

External aircraft noise octave band adjustments for sound insulation design (adjustments derived from ASTM E 1332-90 (2003))						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
6	5	0	-3	-6	-8	-11

10.4.2.21 Prior to a building consent being issued for any building to which Rules 10.4.2.19 and 10.4.2.20 applies, compliance shall be demonstrated by:

- (a) For visitor accommodation, by production of a design certificate from an appropriately qualified and experienced acoustic engineer, certifying that an internal noise level not exceeding 40dBA Ldn will be achieved in habitable rooms by construction in accordance with the proposed design; and
- (b) For other activities, by production of design certificate from an appropriately qualified and experienced acoustic engineer, certifying that an internal noise level not exceeding 45dBA Ldn will be achieved in habitable rooms.
- (c) Where it is necessary to have doors and windows closed to achieve the acoustic standard an alternative ventilation system shall be provided as follows (ac/hr means air changes per hour):
 - (i) Main living rooms: low setting 1-2 ac/hr and on high setting 15 ac/hr as a minimum.
 - (ii) Other habitable rooms: low setting 1-2 ac/hr and on high setting 5 ac/hr as a minimum.

- (iii) Each system must be able to be individually switched on and off and when on, be controlled across the range of ventilation rates by the occupant with a minimum of three stages.
- (iv) Each system providing the low setting flow rates is to be provided with a heating system which is able to provide the incoming air with a 12°C heat rise when the airflow is set to the low setting. Each heating system is to have a minimum of two equal heating stages.
- (v) If air conditioning is provided to any space then the high setting ventilation requirement for that space is not required.
- (vi) Noise from ventilation systems shall not exceed the following noise limits:

Room type	Noise level measured at least 1m from the Diffuser (Leq dBA)	
	Low setting	High setting
Main living rooms	35	40
Other habitable rooms	30	35

10.4.2.22 Visitor accommodation inside the SEL 95 boundary shown on the Planning Maps and Appendix O10 shall incorporate appropriate acoustical treatment to ensure that indoor sound levels stated below are not exceeded:

- (a) The Internal Sound Exposure Level (SEL) from aircraft noise shall not exceed 65dBA in all sleeping areas of new visitor accommodation and extensions or additions to existing visitor accommodation; and
- (b) The internal noise level shall be calculated in accordance with the predicted external level at the subject site as shown on the plan of SEL contours in Appendix O10 with the following adjustments to the dBA level to establish an unweighted external source spectrum for aircraft noise as follows:

External aircraft noise octave band adjustments for sound insulation design						
63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
6	5	0	-3	-6	-8	-11

Note: Adjustments derived from ASTM E 1332-90 (2003) Table 1

10.4.2.23 Prior to issuing a building consent for any building to which Rule 10.4.2.22 applies, compliance with the rule shall be demonstrated by production of a design certificate from an appropriately qualified and experienced acoustic engineer certifying that the above internal noise level will be achieved by construction in accordance with the proposed design, provided that:

- (a) Where it is necessary to have doors and windows closed to achieve the acoustic standard an alternative ventilation system shall be provided for sleeping areas at 1-2 a/c per hour on low setting and a minimum of 5 a/c per hour on high setting, where a/c per hour means: air changes per hour; and
- (b) Each system must be able to be individually switched on and off and when on, be controlled across the range of ventilation rates by the occupant with a minimum of three stages; and
- (c) Each system providing the low setting flow rates is to be provided with a heating system which is able to provide the incoming air with a 12°C heat rise when the airflow is set to the low setting. Each heating system is to have a minimum of two equal heating stages and

- (d) If air conditioning is provided to any space then the high setting ventilation requirement for that space is not required.
- (e) Noise from ventilation systems shall not exceed the following noise limits:

Room type	Noise level measured at least 1m from the Diffuser (Leq dBA)	
	Low setting	High setting
Sleeping areas	30	35

Activities that fail to comply with Rules 10.4.2.19 to 10.4.2.23 will require a resource consent for a discretionary activity.

Rule - Vibration

- 10.4.2.24 Vibration emanating from a site shall meet the limits recommended in and be measured and assessed in accordance with New Zealand Standard NZS 4403:1996 Code of Practice for Storage, Handling, and Use of Explosives.

Activities that fail to comply with this rule will require a resource consent for a restricted discretionary activity, with the discretion being restricted over:

- Safety; and
- Time and duration of effect; and
- Effects on buildings and structures, either on site or on surrounding properties.

These matters will be considered in accordance with the assessment criteria in Section 21.

Rule - Construction noise

- 10.4.2.25 Construction noise emanating from a site where construction is ancillary to the principal use shall meet the limits recommended in and be measured and assessed in accordance with New Zealand Standard NZS 6803:1999 Acoustics – Construction Noise.

Activities that fail to comply with this rule will require a resource consent for a restricted discretionary activity with the discretion being restricted over:

- Time and duration of effect; and
- Effects on surrounding buildings and properties.

These matters will be considered in accordance with the assessment criteria in Section 21.