



Rotorua District Plan
Revision of Noise Rules – Rotorua District Specific Acoustic Issues

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Project: **Rotorua District Plan
Revision of Noise Rules**

Prepared for: **Rotorua District Council
Private Bag 3029
Rotorua**

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Status:	Issue:	Date:	Prepared by:	Reviewed by:
Final	1	10 September 2010	D Ellerton	G Warren

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1.0 INTRODUCTION

The Rotorua District Council, in order to fulfil its requirements under the Resource Management Act 1991, has begun the process of reviewing its District Plan. As part of this process, Marshall Day Acoustics (MDA) has been engaged to review the existing noise rules and work with Council on revising these if necessary.

The review of the Rotorua District Plan is being done with a view to ensuring consistency of approach with similar neighbouring Local Authorities. The Whakatane and South Waikato District Council have also engaged MDA as part of this project. For the purposes of this report, Rotorua, Whakatane and South Waikato District Councils will be referred to as “the Councils”.

In April 2009, the Councils met to discuss the review of noise and acoustic issues in the upcoming review of their respective District Plans. The Councils are considered to have a similar urban to rural ratio and similar land use composition albeit with some variation in relativities of scale. These outcomes are described in MDA report “*General Noise Issues for Rotorua, Whakatane and South Waikato District Councils*” dated 9 September 2010.

In the development of this report, the author spent several weeks working at Council offices over a period of time in 2009/2010 and working closely with Council staff to address the District specific noise issues.

There are elements of common issues that all Councils must consider when reviewing their noise rules, and between these three Councils an agreement to minimise cross boundary anomalies on general matters regarding noise. In addition District specific reports are to be provided dealing with the unique acoustic issues that each District has. Attached as Appendix A is a brief glossary of acoustic terms.

This report addresses the Rotorua District specific acoustic issues. The issues were identified by Council staff and MDA and include:

- Large scale community events
- Close proximity of industrial and residential uses at Ngapuna
- Development of the Lakefront over time
- Helicopters
- Fonterra Reporoa
- National Environmental Standards
- Activities exempt from standard noise rules

2.0 ROTORUA DISTRICT SPECIFIC ACOUSTIC ISSUES

2.1 Large Scale Community Events

Many Councils encounter difficulties in addressing large scale community events because of the perceived delay due to the resource consent process. There can also be a conflict with the timeframe in which an international performer is booked and the consenting process.

In order to recognise the importance to the community and District of large scale community events, we have proposed noise limits that would apply to such events. The principle controls are the hours of operation and limit on the number of times per year such events can take place.

Table 1: Large Scale Community Events

Issue	MDA Recommended Noise Controls
Total number of music concerts per year	6
Finishing time	10.30pm
Permitted noise limit at receiving zone	4 events up to 3 hours total duration 80dB $L_{Aeq(1\text{ hour})}$
	2 events up to 12 hours per day for two consecutive days 70dB $L_{Aeq(1\text{ hour})}$
Octave Band Limits	Octave Band Noise Levels shall not exceed 85dB $L_{eq(1\text{ minute})}$ at 63Hz 75dB $L_{eq(1\text{ minute})}$ at 125Hz
Venues	Council owned or controlled land

The MDA recommendations for large scale community events include a provision for a longer duration event (12 hours over 2 consecutive days), but at a noise level that is greater than the day to day limit, but not as high for shorter 3 hours events. The intention for this is to allow whole day/weekend festival type events to be permitted, but with some control of noise emissions.

In addition, a limit on noise levels at 63 and 125Hz have been provided. These frequencies can be used to characterise the low frequency content or bass content, which can, if uncontrolled, cause annoyance even at moderate overall noise levels.

We recommend that a marked up map of all potential sites is produced and feedback reviewed as part of the district plan review consultation process.

We have also recommended that events be permitted on Council owned or controlled land only. The purpose of this is to provide some certainty for the public, that because the Council is involved through land ownership/ lease, there is less likely to be non-compliance with the noise controls because of the potential for the Council to receive negative local community response.

There is understood to also be a number of large scale events held on private property. These have not been addressed specifically but should be assessed on a case by case basis. Currently they may enjoy existing use rights, and/or may choose to formalise their activities through the resource consent process.

2.2 Ngapuna

The issue with the Ngapuna area of Rotorua City is the close proximity of incompatible uses as shown in Figure 1. Currently there are timber processing sites operating 24 hours per day immediately adjacent to established residential housing.

We understand Council officers have previously measured noise levels at houses in excess of 60-65 dB L_{A10} at night. This level of noise is unacceptably high for residential use. The proposed realignment of State Highway 30 could also increase noise levels further.

Figure 1: Ngapuna



We understand the existing situation has arisen incrementally over the past century, and is a matter that will need to be resolved. In our opinion, the District Plan review is unlikely to be the best tool for addressing this, because:

- Ngapuna residents have strong cultural links to the area and are not likely to move.
- Requiring houses to retro fit improved glazing, building façade components and mechanical ventilation services is likely to be too expensive for individuals to fund.
- Rezoning the residential land as Commercial or Industrial does not address the potential noise effects on residents in the short to medium term.
- Industrial activities may also have a legitimate claim to existing use rights.
- Rezoning Industrial land as Residential in order to attempt to force them to reduce noise levels is likely to be ultra vires given existing use rights.
- Requiring industry to fund improvement of sound insulation of houses is difficult to enforce and apportion.

Possible solutions include:

- Council or Central government funded improvement of house sound insulation.
- Voluntary relocation of industry from the area.

This could only be attractive if Council established a special zone for these industries with robust noise rules to future proof their operations from residential uses and potential reverse sensitivity issues.

There may be a number of other alternatives; however MDA considers that they are unlikely to be determined within the timeframe of the Proposed District Plan.

2.3 Lakefront Development

We understand there is likely to be increased development of the lakefront over time. Because the Plan is an effects based document with respect to noise, it is not the zoning of the noise emitter that is important but that of the noise impacts on the receiver.

Currently, the lake front area has Residential A zoned land immediately adjacent (Ohinemutu Village). The expectation for noise from any development of the Lakefront is that the total noise would be controlled to residential amenity levels at this interface.

Depending on the range of activities that may take place on the lakefront, and the location of this with respect to Ohinemutu, the potential noise effects may or may not be acceptable.

If a Lakefront Zone is established and café/bar activities are developed for instance, these may encounter problems in complying with night time noise limits, even if the nearest noise sensitive receiver (Residential zone) is 100m away.

If however, as part of the developed design potential noise issues were considered, the Lakefront Zone and Ohinemutu village may be able to coexist. This would take careful planning and consideration of noise issues in the overall design.

For instance, if the existing lakefront reserve is developed through a series of separate resource consent(s) there would be an expectation that in order to mitigate potential noise effects that individual compliance with the Plan rules would occur.

It is possible that with a number of individual consent holders each operating within the noise limits of their resource consent that the total noise at nearby Residentially zoned receivers could be significantly higher than intended by the proposed Plan.

It is recommended that Council should consider the potential cumulative noise effects that may result if development occurs in this piecemeal manner rather than as an integrated controlled development. One method of control would be through specific noise rules for any Lakefront activity that identifies the potential issue of cumulative noise effects and sets a noise limit accordingly. The form that such a noise rule/control would take could be developed, should a Lakefront Zone be established.

2.4 Helicopters

The issue of helicopter noise has been raised by Council staff as an issue which is increasingly requiring Council resource. We understand helicopter movements for commercial use such as forestry and tourism as well as private use is increasing.

The current New Zealand standard used to determine the acceptability of helicopter noise is NZS6807:1994 "Noise management and land use planning for helicopter landing areas". NZ6807 includes noise limits for residential and rural residential receivers and is intended to apply to helicopter landing areas used for 10 or more flight movements in any month.

We have recommended in Table A2 in section 5 of this report that a simple reference requiring compliance with NZS6807 as being sufficient to provide the necessary framework to control helicopter noise.

2.5 Fonterra Reporoa

A meeting was held at Rotorua District Council with representatives of the District Plan review team and Fonterra to discuss noise from the Reporoa dairy factory.

The purpose of the discussion was to establish whether a noise control boundary (NCB) is appropriate around the Fonterra Reporoa site.

The NCB concept is used primarily around air and sea ports. In effect it signals clearly to Fonterra, the Council's expectations for noise emissions from the Reporoa site. This can provide a degree of certainty for both Fonterra and Council. Should Fonterra wish to expand its facility, this may occur with respect to noise providing the limits applying at the NCB will not be breached.

A NCB can also demonstrate to potential new residents the noise environment around the Reporoa site. Existing residents can also derive certainty that the level of noise from the Reporoa site will not increase above that shown in the District Plan.

The utilisation of NCBs is used in many Plans throughout New Zealand. The South Taranaki District Plan for example has a NCB around the Fonterra Whareroa plant.

At the time of writing this report a draft proposed NCB was being prepared by Fonterra for consideration by Council.

2.6 Rotorua Urban Transport Strategy (RUTS)

The Rotorua District Council has previously considered a separate zone for the Districts roading network. In 2000 MDA were retained to assist with the development of noise performance standards.

At that time, the "Transit Guidelines" were the only source of local guidance with regard to the suitability of noise from roading network with regard to amenity and housing.

However, more recently NZS 6806: 2010 Acoustics – "Road traffic Noise: New and altered roads" has been released with considerable input from the New Zealand Transport Agency. The expectation is that NZS6806 will be widely adopted by local authorities, and has been recommended by MDA in this report.

It is our opinion that the MDA report of 2000 and RUTS noise performance standards have been superseded and that NZS6806 provides superior up to date guidance for the consideration of potential noise effects from road traffic noise.

2.7 National Environmental Standards (NES) Telecommunication Facilities

Currently there is only one NES that specifies noise limits. Because an NES is binding and over rides the provisions of a District Plan, we have compared these requirements to those recommended as part of the review to ensure they are not significantly out of alignment.

The Telecommunication Facilities NES sets a noise limit for residential, rural and open space/reserve areas at a distance of 3m within the receiving site of 50dB $L_{Aeq(5 \text{ minutes})}$ between 7am and 10pm and 40dB $L_{Aeq(5 \text{ minutes})}$ and 65dB L_{Amax} between 10pm and 7am.

For business and industrial areas (and any other non-noise sensitive zones) a noise limit of 60dB $L_{Aeq(5 \text{ minutes})}$ at all times.

The NES noise limits are very similar numerically to the recommended noise limits in section 5 Table A1.

In our opinion there is unlikely to be any significant conflict between the NES for Telecommunication Facilities and the proposed Plan noise limits.

2.8 Activities Exempt From Standard Noise Rules

A number of activities have been identified during the Plan review as requiring exemption from the standard noise limits contained in Table A1. These activities are required to comply with alternative noise limits as specified in Table A2.

We have summarised the Table A2 activities and the reasoning behind the recommendation for their separate control in Table 2.

Table 2: Summary of Noise Rules Exemptions

Activity	Issues	Recommendation
Construction Noise	Construction noise is recognised as an essential process associated with many activities. Construction noise is a limited duration activity and will generally conclude when an activity commences.	Adopt NZS6803:1999 for measurement and assessment of construction noise.
Temporary Military Training	Military activities including training are recognised as important to the security of New Zealand and a relaxation of daytime noise rules is warranted on this basis. Many District Plans throughout New Zealand provide for this type of activity.	Same provision as previous Plan rules
Vehicles and mobile machinery associated with rural production	Noise levels generated by vehicles and mobile machinery associated with rural production activities can vary widely throughout the year and are often temporary and transient. Strict compliance with standard activity district wide noise rules may not be practicable, reasonable or enforceable.	Reinforce need to satisfy S.16 and 17 of the RMA.
Prospecting and Exploration	These activities can range from short term sporadic exploration to more long term operations. The activities can also include blasting and other processes that result in short term high noise level events as well as ground borne vibration.	Compliance with standard activity district wide noise rules except for blasting which has more appropriate criteria provided. Criterion for ground borne vibration has also been included.
Community Events	Large scale community events can be difficult to organise because of potential delays through the resource consent process. The short term duration of such events is	Make provision for a limited number of community events to be held within the District. Limit the number of events which can be held at any one of the designated

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Activity	Issues	Recommendation
	unlikely to result in any potential on going noise effect if controlled through appropriate rules.	venues per year to give nearby resident's certainty of outcome. Criteria for low frequency sound characterised by 63 and 125Hz octave bands has been included to minimise potential annoyance, particularly with regard to events lasting 12 hours.
Helicopters	Helicopter noise can result in adverse community response. NZS6807 outlines noise limits and planning strategies to manage this.	Adopt NZS6807:1994 for managing noise and planning issues regarding helicopters.
Wind turbine generators	Noise from wind turbines with a swept area greater than 80m ² require special analyses that cannot be undertaken using NZS6801 and 6802.	Adopt NZS6808:2010. Acoustics – Wind farm noise
Dwellings/ occupancies/ habitable spaces in zones other than Residential and Rural	Reverse sensitivity issues can arise when potentially noise sensitive activities such as dwellings are developed in business and industrial zones.	Require habitable spaces in non residential areas to provide sound insulation to protect the occupants from the noise of legitimate activities within that zone.
Audible bird scaring devices and frost fans	Can result in significant impact and adverse reaction from adjacent land uses. Some recognition should be given to horticultural activities using techniques required to protect crops. The potential noise sources can be difficult to assess using standard activity district plan noise rules.	Noise rules specifically designed to provide acoustic parameters that reflect the unique noise sources.

3.0 RECOMMENDED NOISE AND VIBRATION RULES

Proposed noise rules for the Rotorua District Plan are provided in Section 5 of this report. The significant areas of change from the previous noise rules include:

- All noise rules contained in one section of the District Plan, with all other sections of the Plan, cross-referenced to them as required. In our view, this provides clearer, more concise rules.
- Deletion of evening period. We have recommended the day/night split is 7am to 10pm for the day and 10pm to 7am for the night time period which is in line with other Plans i.e. New Plymouth District, Whangarei and Invercargill.
- There may be a temptation to adopt a half way approach with regard to the start of the night time period i.e. 8pm; or to keep all day Sunday noise rule to the equivalent night time limit. In our experience there has been no adverse community reaction in those districts where the night time period begins at 10pm and finishes at 7am seven days per week.
- Noise rules to apply to all days of week equally.
- Previous separate noise rules for temporary military activities and prospecting/ exploration have been included as part of the single noise section.
- Prospecting and exploration activities have been provided for separately because on occasions they may potentially emit noise and vibration of a significant magnitude. This type of noise and vibration event is not well catered for under the general noise rules.
- Adoption of 2008 versions of NZS6801 and 6802 as the cornerstone standards for the measurement and assessment of environmental noise.
- The use of L_{Aeq} and L_{A90} acoustic descriptors rather than previous L_{10} and L_{95} .
- Referencing a full range of New Zealand Standards regarding acoustics. In particular, the guidance provided for wind turbine generators and helicopters will provide a better degree of certainty for operators and community alike.
- Other international standards have been cited, principally regarding vibration.
- Ability for a limited number of Community Events to be held each year which do not require separate resource consents. A relaxation of noise limits is recommended in recognition of the limited nature of such events and an overall benefit to community.
- Inclusion of noise limits for audible bird scaring devices and frost fans.

4.0 BENCHMARKING

In order to ensure the recommended changes are not out of step with other Councils' a brief review of recommendations for the Tauranga and Western Bay of Plenty District Plans has been completed.

MDA staff was involved with the Tauranga District Plan review and this project resulted in relatively minor "tidying up" of the noise rules. Several of the recommendations we have made for the Rotorua District Plan noise rules have been either in place in Tauranga for several years or have been recently adopted.

The Western Bay of Plenty recommendations were only completed by Aurecon in August 2009. There are several recommendations that are in line with those included in this report –embracing the updated versions of NZS6801 and 6802 and removing protection of Sunday with night time noise limits.

There are several areas of the Aurecon report on behalf of Western Bay of Plenty which we would not recommend for the Rotorua District Plan. For instance we would strongly recommend against the removal of Industrial intra zone noise limits. Furthermore, we would not recommend the abridgement of New Zealand Standards (NZS6803:1999 in this case) within the Plan but rather reference a standard in its entirety. This methodology avoids the potential for confusion in the application of the limits.

In our opinion, and experience of working with many different District and City Plans throughout New Zealand, the recommendations as part of the review of the Rotorua District Plan are a pragmatic balance of allowing commercial activities to operate without compromising the amenity of potentially noise sensitive receivers.

5.0 RECOMMENDATIONS - ENVIRONMENTAL STANDARDS

This section contains recommended noise rules and the form they should take.

5.1 Noise

Noise shall be measured and assessed using the following standards:

- NZS 6801:2008 Acoustics – Measurement of Environmental Sound
- NZS 6802:2008 Acoustics – Environmental Noise
- NZS 6803:1999 Acoustics – Construction Noise
- NZS 6805:1992 Airport Noise Management and Land Use Planning
- NZS 6806: 2010 Acoustics – Road traffic Noise: New and altered roads
- NZS 6807:1994 Noise Management and Land Use Planning for Helicopter Landing Areas
- NZS 6808: 2010 Acoustics – Wind farm noise
- NZS 6809:1999 Acoustics – Port Noise Management and Land Use Planning

Noise levels shall be measured and assessed at or within the site boundary of the noise receiver unless specified otherwise. The assessment position for houses, dwellings and habitable buildings in the Rural zone is within the notional boundary as defined in NZS6801.

Where standards are implemented that suggest an alternative measurement location, this shall be discussed and agreed with appropriate Council staff. Any reports submitted to Council shall describe the use of an alternative measurement position and the reasons for its use.

5.2 Vibration

Vibration from any activity shall in the first instance be measured and assessed in accordance with the following standards:

- AS 2670.1-2001 Evaluation of human exposure to whole-body vibration – General requirements
- AS 2670.2-1990 Evaluation of human exposure to whole-body vibration - Continuous and shock-induced vibration in buildings (1 to 80 Hz)
- DIN 4150-3:1999 Effects of vibration on structures

Where a scenario arises where these standards are not best suited in assessing the vibration source or receiver of interest, Council may through the resource consent process agree to the use of alternative standards.

5.3 Alternative Noise Measurement Position

Alternative measurement location(s) to those specified in Section 7 may be appropriate on a case by case basis. This shall be discussed and agreed with appropriate Council staff. Any reports submitted to Council shall describe the use of an alternative measurement position and the reasons for its use.

5.4 Noise Limits

Noise from any activity (not listed in Table A2) shall not exceed the following limits in Table A1 when measured at or within the following receiving zones.

Table A1: Noise Limits

Current Zone	Noise Limits, dB		Notes
	Daytime	Night-time	
	On any day 7am to 10pm	At all other times	
Residential A-C	50 L _{Aeq}	40 L _{Aeq} 70 L _{Amax}	
Resort A-D	60 L _{Aeq}	50 L _{Aeq} 75 L _{Amax}	
Residential D, Commercial A-H and Transitional Development	65 L _{Aeq}	60 L _{Aeq} 75 L _{Amax}	Octave band noise levels should not exceed: 75dB L _{eq(1 min)} at 63Hz 65dB L _{eq(1 min)} at 125Hz
Industrial A and B	75 L _{Aeq}	70 L _{Aeq} 80 L _{Amax}	
Rural A, B, B1, C, D and F	50 L _{Aeq}	40 L _{Aeq} 70 L _{Amax}	To be measured and assessed within the notional boundary
Reserve A and B	50 L _{Aeq}	45 L _{Aeq} 70 L _{Amax}	
Water A and B	55 L _{Aeq}	45 L _{Aeq} 70 L _{Amax}	
Scheduled Activities	No recommendations. Being reviewed in 2010		

The activities in Table A2 are exempt from the noise limits of Table A1. These activities are recognised as having different qualities associated with them and therefore must comply with the following noise limits when measured at or within the site boundary of a receiving site, notional boundary of rural houses, dwellings or habitable buildings or other appropriate assessment position.

Table A2: Noise limits

Activity	Noise Controls			
Construction Noise	Comply with the provisions of NZS6803:1999 – Construction Noise			
Temporary Military Training	At any zone	L _{Aeq} , dB	L _{Amax} , dB	
	0630-0730hrs	60	70	
		75	90	
	0730-1800hrs	70	85	
	1800-2000hrs	40	60	
2000-0630hrs				
Vehicles and mobile machinery associated with rural production	Exempt providing they are of limited duration and not in a fixed location and are vehicles and mobile machinery associated with rural production activities and S16 and S17 of the RMA have been satisfied. Examples include harvesting, spraying and planting machinery.			
Prospecting and Exploration	<p>Shall comply with the relevant zone noise limits at the specified measurement and assessment position for those zone(s), except that blasting noise and all vibration shall comply with the following:</p> <ul style="list-style-type: none"> • Occur only between 7am and 7pm; and • No more than 2 events per hour, with a maximum of 8 events per day; and • All occupiers of houses, dwellings or habitable buildings within a 2 kilometre range shall be advised in writing no less than 5 working days prior to the blasting occurring; and • Overblast pressure incident on houses or habitable buildings shall not exceed 115dB L_{Zpeak}; and • Ground borne vibration shall not exceed the limits specified in DIN4150-2:1999 and Part 3:1999. 			
Community Events	<p>Shall comply with the zone noise limits at the specified measurement and assessment position for those zone(s). Except as follows:</p> <p>A total of up to 6 events per year between 7am and 10.30pm may be held providing the following criteria are met:</p> <ol style="list-style-type: none"> 1. For 4 events in any 12 month period a noise limit of 80dB L_{Aeq(1 hour)} within relevant adjacent zone(s) providing the event and pre event rehearsal do not individually exceed 3 hours in duration. 2. For 2 events in any 12 month period – a noise limit of 70dB L_{Aeq(1 hour)} within relevant adjacent zone(s) providing the event does not exceed 12 hours per day over a two day period. 3. No more than 3 of the 6 events held shall be at any one of the venues listed 			

Activity	Noise Controls
	<p>in sub clause 5 below.</p> <p>4. Octave band noise levels at houses, dwellings or habitable buildings shall not exceed:</p> <p>85dB $L_{eq(1 \text{ min})}$ at 63Hz</p> <p>75dB $L_{eq(1 \text{ min})}$ at 125Hz</p> <p>5. The total of 6 events per calendar year may be held only at the following locations:</p> <ul style="list-style-type: none"> • Village Green • Government Gardens • Blue Lake • Telletuby Hill • Arawa park • Kuirau Park <p>Note: The above locations and event frequencies are recommendations for Council consideration only and will be reviewed as part of the district plan review consultation process.</p>
Helicopters	Shall comply with the provisions of NZS6807:1994 – Noise management and land use planning for helicopter landing areas.
Wind turbine generators with swept area greater than 80m ²	Shall comply with NZS 6808: 2010 Acoustics – Wind farm noise
Dwellings/ occupancies/ habitable spaces in zones other than Residential and Rural	<p>A dwelling or occupancy or habitable space is permitted in zones other than Residential and Rural if the total internal noise level in any habitable room does not exceed 35dB $L_{Aeq(24 \text{ hours})}$ while at the same time complying with the ventilation requirements of clause G4 of the New Zealand Building Code. The total noise level shall include all intrusive noise and mechanical services.</p> <p>In determining the external noise level, an assumption that the noise incident upon the noise sensitive facade is from at least three separate activities simultaneously generating the maximum allowable noise level for that zone.</p> <p>Compliance with the above must be confirmed in writing by a suitably qualified and experienced acoustic consultant.</p>

Activity	Noise Controls
Audible bird scaring devices	<p>Noise from audible explosive bird scaring devices shall only be operated between sunrise and sunset, and shall not exceed 100dB L_{Zpeak} when measured within the notional boundary of any rural zoned site, or within the site boundary of any residential zoned site.</p> <p>Discrete sound events of a bird scaring device including shots or audible sound shall not exceed 3 events within a 1 minute period and shall be limited to a total of 12 individual events per hour.</p> <p>Where audible sound is used over a short or variable time duration, no event may result in a noise level greater than 50dB SEL when assessed at the notional boundary of any rural zoned site, or within the site boundary of any residential zoned site.</p> <p>A legible notice is fixed to the road frontage of the property on which is the device is being used, giving the name, address and telephone number of the person responsible for the operation of any such device(s).</p>
Frost fans	<p>Noise generated by frost fans shall not exceed 55dB $L_{Aeq(15min)}$ when assessed within the notional boundary of any other rural zoned site, or within the site boundary of any residential zoned site.</p> <p>A legible notice is fixed to the road frontage of the property on which it is being used, giving the name, address and telephone number of the person responsible for its operation.</p>

Noise Assessment Matters

In considering any application for resource consent for activities that are not predicted to comply with the relevant zone noise controls, the matters to be considered by Council shall include, but are not limited to, the following:

- The nature of the zone within which the noise generating activity is located and its compatibility with the expected environmental results for that zone.
- The nature of any adjoining zone(s), and the compatibility of the noise generating activity with the expected environmental results for those adjoining zone(s).
- Existing Ambient noise levels.
- The length of time for which specified noise levels will be exceeded, particularly at night, with regard to likely disturbance that may be caused.
- The potential for cumulative noise effects to result in an adverse outcome for receivers of noise.
- The likely adverse impacts of noise generating activities both on and beyond sites, on a site, on visitors, users of business premises, or on public places in the vicinity.

- The extent to which the noise may detract from enjoyment of any recreation or conservation area.
- The maximum level of noise likely to be generated, its nature, character and frequency, and the disturbance this may cause to people in the vicinity.
- Whether the noise generated would be of such a level as to create a threat to the health or well-being of persons living or working in the vicinity.
- The proposals made by the applicant to reduce noise generation. This may include guidance provided by a suitably qualified and experienced acoustic consultant.
- The value and nature of entertainment activities and their benefit to the wider community, having regard to the frequency of noise intrusion and the practicality of mitigating noise, or utilising alternative sites.
- The extent to which achieving the relevant limits is practicable, given any existing activities which create noise, particularly on the interface with commercial, industrial or recreational activities.
- The extent to which achieving the relevant limits is practicable where the existing noise environment is subject to significant noise intrusion from road, rail or air transport activities.
- The adequacy of information provided by the applicant.
- The level of involvement of a suitably qualified and experienced acoustic consultant in the assessment of potential noise effects and/or mitigation options to reduce noise emissions.
- Any other relevant standards, codes of practice or assessment methods based on robust acoustic principles.

APPENDIX A: DEFINITIONS

$L_{Aeq(t)}$	is the time-averaged, A-weighted sound pressure level during the sample period and effectively represents an average value. The suffix “t” represents the time period to which the noise level relates. A 15 minute measurement previously denoted as “55 dBA L_{eq} ” is now stated as “55 dB $L_{Aeq(15min)}$ ”; this should however not be confused with the rating level assessment as defined in NZS6802.
L_{AFmax}	is the maximum A-weighted sound level measured using fast response (hence F), during a chosen sample period and previously denoted as L_{max} .
L_{AFmin}	is the minimum A-weighted sound level measured using fast response (hence F), during a chosen sample period.
L_{A10}	is the A-weighted sound level that is exceeded for 10% of the sample period. Previously denoted as L_{10} , this parameter has been used for many years to describe intrusive sound. In the latest version of New Zealand standards, it has been replaced by $L_{Aeq(t)}$.
$L_{90(t)}$	is the sound level that is exceeded for 90% of a chosen sample period, and is used to quantify background noise. Generally A-weighted (and denoted $L_{A90(t)}$), with the suffix “t” denoting the measurement time. L_{90} has replaced the previous L_{95} to bring New Zealand into line with International practice.
L_{AE}	is the A-weighted Sound Exposure Level, previously known as SEL. This is a notional parameter and is the sound level, that if maintained for a constant 1 second, contains the same energy as the varying noise level.
A-weighting	is the process by which noise levels are corrected to account for the non-linear frequency response of the human ear.
NZS6801	New Zealand Standard NZS 6801:2008 <i>Acoustics—Measurement of Environmental Sound</i>
NZS6802	New Zealand Standard NZS 6802:2008 <i>Acoustics—Environmental Noise</i>
dB	decibels are a logarithmic unit used to measured sound pressure. A doubling of sound pressure results in a 3 dB increase in sound level.
L_{dn}	is a “day-night” noise level. This is an L_{eq} measured over a 24hr period, where night-time noise levels are penalised by 10 dB to account for additional annoyance during sleeping hours.