



**Project:** **GULL SERVICE STATION**

**Prepared for:** **Gull NZ Ltd**  
**C/- Hayson Knell Ltd**  
**PO Box 381**  
**Tauranga 3140**

**Attention:** **Grace Burman**

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## 1.0 INTRODUCTION

Marshall Day Acoustics has been retained to consider the potential noise emission from a proposed unattended service station at 68-72 Great South Road which is the former State Highway 1 that has now been superceded.

Gull NZ Ltd have a number of these sites in New Zealand which allow self-service fuel to be purchased at an unattended service station. The site will not have a retail component and will not provide those services such as food, beverage and consumables offered by other service stations.

Because Gull NZ Ltd have a number of similar sites, they are able to predict the likely number of vehicles that will use their facility. This information has been used to consider the peak one hour period for the day and night-time periods, and where this can comply it strongly implies compliance at other times also.

## 2.0 SITE LOCATION

The applicant site is located in the Business Town Centre zone with Residential and Business zoned land nearby as well as Reserve land opposite.

Figure 1 illustrates the site location, layout and Waikato District Plan (WDP) zoning for the Proposed Plan. Also shown are the nearest potentially affected neighbours. Attached as Appendix A is a glossary of acoustic terminology.

Figure 1: Site location



Image source: Technitrades Architecture/WDP

### 3.0 NOISE CRITERIA

The default noise prediction evaluation involves simply determining whether noise limits can or cannot be met. Where they are met an activity is generally considered permitted with respect to noise.

The WDP is being reviewed and is currently in the Hearings process. We understand there have been no submissions in objection to the proposed changes to zone noise rules. Therefore, we have adopted the proposed Plan noise limits which are considered more restrictive than the Operative Plan.

#### 3.1 Waikato District Plan (CDP)

The site location and zoning is discussed in Section 2. The WDP noise rules references NZS6801/6802:2008 and NZS6803:1999 and this is considered current best practice.

The applicable noise rules are as follows:

P2	<p>1. Noise measured within any <u>site</u>:</p> <p>(i) In the Business Town Centre Zone must not exceed:</p> <p>A. 65dB (L<sub>Aeq</sub>), 7am to 11pm every day; and</p> <p>B. 55dB (L<sub>Aeq</sub>) and 85dB (L<sub>Amax</sub>), 11pm to 7am the following day; or</p> <p>(ii) In the Residential Zone and Village Zone must not exceed:</p> <p>A. 55dB (L<sub>Aeq</sub>), 7am to 7pm; and</p> <p>B. 50dB (L<sub>Aeq</sub>), 7pm to 10pm; and</p> <p>C. 40dB (L<sub>Aeq</sub>) and 65dB (L<sub>Amax</sub>), 10pm to 7am the following day.</p>
P3	<p>(a) Noise measured within any <u>site</u> in any zone other than the Business Town Centre Zone, Residential Zone or Village Zone must meet the permitted noise levels for that zone.</p>
P4	<p>(a) Noise levels must be measured in accordance with the requirements of NZS 6801:2008 Acoustics - Measurement of Environmental Sound.</p> <p>(b) Noise levels must be assessed in accordance with the requirements of NZS 6802:2008 Acoustics - Environmental Noise.</p>
D1	Noise that does not comply with Rules 18.2.1.1 P2, P3 or P4.

There are no noise limits applicable for land zoned Reserve and therefore we will not discuss this further.

### 4.0 PREDICTED NOISE LEVELS

We have considered the potential noise levels at receiver sites in Tables 1 - 2 with regard to the following:

- Activity - peak hour; and
- Activity - off peak hour; and
- Delivery of fuel.

Existing traffic numbers on Great South Rd provided by Traffic Solutions is understood to be:

- 4,500 per day
- Daytime peak hour approximately 450 vehicles on Great South Rd
- Peak night-time hour of 45 vehicles on Great South Rd

The identified nearest potentially affected receivers are:

- 73 and 80 Great South Rd – Residential
- 25 Market St – Business

**Table 1: Predicted noise levels at nearest Residential zoned land – 73 and 80 Great South Rd**

Activity	Number vehicles per hour	Predicted noise level, dB LAeq	Plan noise limit, dB LAeq	Complies? Y/N	Comment
Site activity – peak hour	49*	41	55	Y	-
Site activity – off peak hour	8*	33	40	Y	-
Delivery of fuel	1	37	50/40	Y	-

**Note:** \* means vehicle in plus vehicle out

From Table 1 we conclude the following:

- Compliance with the WDP can be achieved for day and night time refuelling of vehicles and delivery of fuel.
- The activity should be considered permitted with respect to noise at the nearest potentially affected Residential properties and consequentially at ones further away also.

**Table 2: Predicted noise levels at Business zoned land adjacent– 25 Market Rd**

Activity	Number vehicles per hour	Predicted noise level, dB LAeq	Plan noise limit, dB LAeq	Complies? Y/N	Comment
Site activity – peak hour	49*	46	65	Y	-
Site activity – off peak hour	8*	38	55	Y	-
Delivery of fuel	1	42	65/55	Y	-

**Note:** \* means vehicle in plus vehicle out

- Compliance with the WDP can be achieved for day and night time refuelling of vehicles and delivery of fuel.
- The activity should be considered permitted with respect to noise at the nearest potentially affected Business zoned properties and consequentially at ones further away also.

#### 4.1 Mitigation of noise

Gull NZ Ltd are aware of their responsibility to mitigate noise from their activity where practicable and we recommend they consider the following:

- Erect signage suggesting customers minimise noise to neighbours.

#### 5.0 SUMMARY

Gull NZ Ltd propose to establish a self-service fuel station at 68-72 Great South Rd.

The fuel station will be available for use 24 hours per day. There are no staff or ancillary services provided via a kiosk.

The predicted noise generated has been based on traffic data based on existing road traffic on Great South Rd which was sourced from Traffic Solutions Ltd.

Our calculations indicate that compliance with the Waikato District Plan noise limits can be achieved within the boundary of all adjacent and potentially affect Residential sites during the day and night-time periods.

## APPENDIX A GLOSSARY OF TERMINOLOGY

<b>Frequency</b>	The number of pressure fluctuation cycles per second of a sound wave. Measured in units of Hertz (Hz).
<b>dB</b>	<u>Decibel</u> The unit of sound level.  Expressed as a logarithmic ratio of sound pressure P relative to a reference pressure of $P_r=20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$
<b>dB(A)</b>	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) so as to more closely approximate the frequency bias of the human ear.
<b><math>L_{A10}(t)</math></b>	The A-weighted noise level equalled or exceeded for 10% of the measurement period. This is commonly referred to as the average maximum noise level.  The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
<b><math>L_{Aeq}(t)</math></b>	The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.  The suffix "t" represents the time period to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
<b><math>L_{Amax}</math></b>	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
<b>Noise</b>	A sound that is unwanted by, or distracting to, the receiver.
<b>Ambient</b>	The ambient noise level is the noise level measured in the absence of the intrusive noise or the noise requiring control. Ambient noise levels are frequently measured to determine the situation prior to the addition of a new noise source.