

PREPARED FOR: **Winstone Aggregates**
PO Box 17195
Greenlane
Auckland 1546

Attention: Tony Carpenter

DATE: 16 March 2010

PROJECT: **Three Kings Quarry**

Noise Compliance Assessment

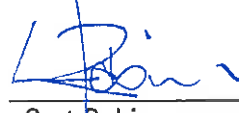
REPORT NO.: 007 2000295A

PREPARED BY:



Kevin Prosée

REVIEWED BY:



Curt Robinson

Table of Contents

1.0	INTRODUCTION.....	3
2.0	NOISE PERFORMANCE STANDARDS	3
3.0	MEASUREMENTS	3
3.1	General.....	3
3.2	Operations and Equipment.....	4
3.3	Results.....	4
3.4	Discussion	5
3.4.1	Grahame Breed Drive.....	5
3.4.2	Fyvie Avenue.....	6
4.0	CONCLUSIONS.....	8
	FIGURE 1 – MEASUREMENT POSITIONS.....	9

1.0 INTRODUCTION

Marshall Day Acoustics Ltd (MDA) has carried out a noise survey at two monitoring positions adjacent to Three Kings Quarry, Mt Eden on 9 March 2010. Winstone Aggregates is required to undertake two noise surveys per year, at two identified monitoring positions, as part of the Environmental Management Plan for the Quarry, in order to determine compliance with the noise rules for the site.

2.0 NOISE PERFORMANCE STANDARDS

The quarry is zoned *Business 7* in the City of Auckland District Plan Isthmus Section – Operative 1999. The closest dwellings are located immediately to the west of the quarry in Fyvie Avenue. The noise rule that relates to quarry operations is:

"Noise Control at the Residential Interface

The L_{10} noise level and maximum level (L_{max}) arising from any activity measured at or within the boundary of any residential zoned property shall not exceed the following limits:

<i>Monday to Saturday</i>	<i>7.00 am – 10.00 pm</i>	<i>L_{10} 55 dBA</i>
<i>Sunday and Public Holidays</i>	<i>9.00 am – 6.00 pm</i>	
<i>At all other times</i>		<i>L_{10} 45 dBA</i>
		<i>L_{max} 75 dBA, or background (L_{95}), plus 30 dBA whichever is the lower</i>

The above noise levels shall be measured and assessed in accordance with the requirements of the NZS 6801:1991 "Measurement of Sound" and NZS 6802:1991 "Assessment of Environmental Sound" or their replacement."

3.0 MEASUREMENTS

3.1 General

Measurements were completed at each of the two measurement positions on 9 March 2010. The first was at the Fyvie Avenue position between 10.40 am and 11.30 am and the second was at the Grahame Breed Drive position between 12.05 pm and 1.15 pm. These positions are the same as in all previous compliance measurements of this type and are shown on Figure 1 attached.

Noise measurements were carried out using a Bruel & Kjaer 2260 sound level meter, which satisfies the requirements for a Type 1 sound level meter according to IEC 651.

Measurements were carried out and assessed generally in accordance with the relevant New Zealand Standards.

The weather was fine with 7/8 octa cloud cover and a slight south-westerly breeze (approximately 1.5–3 m/s).

3.2 Operations and Equipment

The following equipment was observed as operating on the site during the measurement of noise levels. Details were confirmed by the quarry operators following completion of the noise survey.

- 1 x Komatsu WA480-6 wheel loader, moving crushed aggregate from the mobile crusher to the stockpile areas and loading trucks.
- 1 x excavator extracting rock from the quarry face and loading it into the mobile crusher. *Caterpillar 350* operating during Fyvie Ave noise measurement. *Hyundai 210 LC-7* operating during Grahame Breed Drive noise measurement.
- 1 x Terex Pegson 4242SR Mobile Crusher.
- Sprinkler system.
- Water cart (Hino water truck).
- Contractors using weed eating machinery within the quarry to clear excess plant growth.
- Customer trucks collecting product from the bottom of the quarry.

The excavator and crushing plant were operating at the northern end of the quarry. The quarry has since confirmed that all operations were as per normal during the measurement period. Several customer trucks entered and exited the quarry during the measurements.

3.3 Results

The measured noise levels are presented in Table 1 overleaf.

Table 1 – Measured Noise Levels

Measurement Position	Duration	dBA L ₁₀	Noise Sources ⁽¹⁾
Fyvie Avenue	20 minutes	52	<u>Pegson 4242SR Crusher</u> , Komatsu WA480-6 wheel loader ⁽²⁾ , Cat 350 excavator, water cart, customer trucks in quarry, occasional bird and cicada sounds and distant voices, weed-eater noise from quarry.
Grahame Breed Drive	20 minutes	47 ⁽⁴⁾	<u>Cicada noise</u> (constant), Pegson 4242SR Crusher ⁽³⁾ , Komatsu WA480-6 wheel loader ⁽³⁾ , Hyundai 210LC-7 excavator, water cart, customer trucks, weed-eater sounds, distant traffic Mt Albert Rd, background noise from Foodtown.

Notes to Table 1:

- (1) Dominant noise source(s) underlined.
- (2) The wheel loader, although operating, was not audible over the crusher.
- (3) Although this noise source was operating, it was generally not audible due to its distance from the measurement position and the screening provided by rock mounds within the quarry.
- (4) Cicada noise contribution removed from measurement.

3.4 Discussion

3.4.1 Grahame Breed Drive

In terms of activity from the quarry, the most audible noise sources at this position were the water cart and customer trucks while driving up and down the quarry haul road.

There was no direct line-of-sight to the mobile crusher at this measurement position due to the quarry terrain (Refer Photo 1 overleaf) which provided shielding from the noise generated by this machine. The excavator (Hyundai 210LC-7) was visible when gouging raw material from the quarry face.

Ambient noise sources (i.e. not associated with the quarry activity) included cicada noise, distant traffic noise from the surrounding road network and some background noise from the rear of the nearby Foodtown supermarket. These events, where practicable, were paused out to minimise their impact on the quarry measurements, and are considered to have no significant effect on the survey result.

Cicada noise could not be paused out and has therefore been removed from the measurement following frequency analysis.

The adjusted noise level of 47 dBA L₁₀ (i.e. the measured noise level adjusted to exclude noise contribution from cicada noise) readily complies with the relevant noise criterion of 55 dBA L₁₀.



Photo 1 – View from Grahame Breed Drive

3.4.2 Fyvie Avenue

The noise from the quarry at the Fyvie Avenue measurement position was dominated by the Pegson Crusher operating approximately 170 metres away from the measurement position (Refer photos 2 and 3 overleaf). The CAT 350 excavator and loader were also audible, as well as the water truck and customer trucks collecting product and “weed-eating” machinery working within the quarry. A view of the quarry plant from the fence line, near this measurement position, is shown in Photo 2 overleaf.

Ambient noise sources (i.e. not associated with the quarry activity) included occasional bird sounds and distant cicada noise. There was no direct line of sight to the mobile crushing plant or excavator as they were both operating at the lowest level of the quarry.

Photos 2 and 3 overleaf show the location of the crushing plant and excavator in operation during measurements.

The measured noise level of 52 dBA L_{10} complies with the relevant noise criterion of 55 dBA L_{10} .



Crusher location during
measurements

Photo 2 – View from fence line, Fyvie Ave



CAT350 excavator
location during
measurements

Crusher location during
measurements

Photo 3 – View of Excavator & Crusher Operating

4.0 CONCLUSIONS

Marshall Day Acoustics has completed noise monitoring at the two nominated monitoring positions as required by the Environmental Management Plan for the Three Kings Quarry.

Typical operations at the site (i.e. loader, mobile crusher, excavator used to load the crusher, water cart, customer trucks and sprinklers) resulted in noise levels which complied with the relevant noise rules for the site.

FIGURE 1 – MEASUREMENT POSITIONS

