

**OUTDOOR SPORT AND RECREATION
PAINTBALL ADVENTURE COURSE**

107 ABRAHAMS ROAD SOUTH RIPLEY



NOISE IMPACT ASSESSMENT

Commissioned by:	Ajs Surveys
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EXECUTIVE SUMMARY

Delta Force Properties Pty Ltd is seeking to develop a Paintball Adventure Course on land at 107 Abrahams Road South Ripley. The site is formally described as Lot 57 on SP200927.

Palmer Acoustics (Australia) Pty Ltd has been commissioned by AJS Surveys complete a noise impact assessment addressing noise emissions associated with the proposed use. The report aims to address noise emissions from:

- Gaming weaponry
- Player noise
- Site access.

This report has been prepared in consideration of the noise emission criteria of the Environmental Protection Act.

The closest houses to the site are 260m and 560m respectively from the activity boundaries.

Based upon our assessment we conclude:

- Mechanical plant installation is not expected to require noise attenuation treatment;
- Car parking operation will comply with emission criteria;
- Game play will comply with emission criteria.

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1.0 INTRODUCTION

Delta Force Properties Pty Ltd is seeking to develop a Paintball Adventure Course on land at 107 Abrahams Road South Ripley. The site is formally described as Lot 57 on SP200927.

Palmer Acoustics (Australia) Pty Ltd has been commissioned by AJS Surveys to complete a noise impact assessment addressing noise emissions associated with the proposed land use.

The report aims to address noise from:

- Gaming weaponry
- Player noise
- Site access.

This report has been prepared in consideration of the noise emission criteria of the Environmental Protection Act and the Ipswich City Council.

1.1 Existing site and surroundings

The site is located in an established rural area that is to the south of the Centenary Highway. More particularly the site is located 1.7km from the Centenary Highway/ Ripley Road interchange and accessed via Ripley Road, Barrams Road and Abrahams Road. The site is directly accessible off Abrahams Road which is a partially constructed, single lane, dirt track.

The development site is an undulating parcel of land that is naturally divided into 2 areas by a ridgeline that traverses the site in a north south direction. The site has natural ground levels at the Abraham Road frontage of the site ranging between 61.0m AHD (South) and 85.0m AHD (North) and on the eastern boundary the natural ground levels range between 57.0m AHD (South) and 45.0m AHD (North).

The closest houses to the site are 260m and 560m respectively from the activity boundaries.

1.2 Operation

It is expected that the paintball operation will be conducted during daylight hours only, i.e. 7am to 6 pm.

The site will be arranged to contain 7 game zones and an amenities/base camp area on Abrahams Road. A car park will be established to the south of the amenities area. We understand that a typical paint ball game, one per zone, will 10 – 20 minutes and involve the firing of 500 -1000 paintballs.

1.3 Noise sensitive locations

The nearest noise sensitive locations to the proposed activity are residences to the southeast and west. The south-eastern residence, R1, is located approximately 260m from the site boundary and 290m from the nearest proposed gaming zone. The dwelling to the west, R2 is located approximately 560m from base camp. The residence locations are indicated in attached Sketch 1

The proposed operation and extent is indicated on the attached sketches:

- Sketch 1 Locality
- Sketch 2 Proposed site layout

1.4 Report Procedure

The procedure used to prepare this report has been to establish noise emission limits appropriate to the proposed operation and compare these against the predicted noise emissions of paint ball gaming activity. Noise emission limiting levels have been established from the measurement of the current environmental noise levels.

1.5 Report versions

Following advice from the ULDA acoustic referee the assessment criteria were updated.

2.0 EQUIPMENT AND PROCEDURES

2.1 Measurement Procedures

Environmental noise measurements were undertaken at location ML1, indicated on Sketch 1. The logger was located near the southern site boundary on Abrahams Road.

Measurements were conducted over a 7 day period commencing on the 6th August 2012

The results of the survey are presented graphically in Sketch 3.

2.2 Instrumentation

The following instruments were used to measure the ambient noise levels:

- Rion NL-21 No.5 Environmental Noise Logger (serial number 00109016)
- Rion NC-73 Calibrator No.1 (serial number 10265743)

The operation of the sound level measuring equipment was field calibrated before and after each measurement session and was found to be within 0.2dB of the reference signal. All instrumentation used in this assessment has a current calibration certificate from a certified NATA calibration laboratory.

3.0 AMBIENT NOISE LEVELS

3.1 Measured results

The typical average ambient noise levels measured at ML logger are presented in Table 1. Noise present at the time of logger placement included:

- Noise from the Centenary Highway, 380m to the north;
- Occasional traffic on Barrams and Abrahams Roads.

The graphical presentation of the logged result shows elevated noise levels from approximately mid-day Thursday 9th August until midnight Friday 10th August. It is expected that these levels are caused by weather conditions are excluded from calculation.

Table 1: Measured Ambient Noise Levels ML1

Time	Measured Noise Levels ¹ dB(A) ²				
	L _{Amax} ³	L _{A01} ⁴	L _{A10} ⁵	L _{Aeq} ⁶	L _{A90} ⁷
Day: 7 am to 6 pm	62.4	53.2	45.3	43.5	30.8
Evening: 6 pm to 10 pm	50.2	43.4	38.4	35.7	26.2
Night: 10 pm to 7 am	50.3	43.3	36.3	33.5	19.8

3.2 Acoustic Environment

The acoustic environment is strongly influenced by the nearby Centenary Highway and the density of traffic. With reference to Sketch 3 the morning rise in background noise levels, most clearly visible on Tuesday – Thursday mornings is indicative of an early morning peak in traffic density. It also indicates an existing, regular daytime background noise level of approximately 41 dB(A) L_{A90}.

4.0 MECHANICAL PLANT EMISSION NOISE

4.1 Plant Description

Mechanical plant is characterised by emitting continuous or quasi continuous noise, e.g. fans and refrigeration plant. Items of mechanical plant likely to be associated with the amenity area meeting this criterion are air conditioning, refrigerated drinks coolers, etc.

4.2 Noise Emission Criteria

Under the Environmental Protection Act 1994 (post October 2008) Section 440U & 440V air conditioning and refrigeration equipment must not be operated in a way that makes an audible noise—

¹ Average noise levels throughout the period, with the exception of L_{A90} which is the average below the median noise levels for the period.

² dB(A) decibels, A-weighted

³ L_{Amax} refers to the maximum a-weighted sound pressure level occurring during the sampling period

⁴ L_{A01} for a specified time interval, means the A-weighted sound pressure level that is equalled or exceeded for 1% of the interval

⁵ L_{A10} for a specified time interval, means the A-weighted sound pressure level that is equalled or exceeded for 10% of the interval

⁶ L_{Aeq} for a specified time interval, means the time average A-weighted sound pressure level, within the meaning given by AS1055.1 for the interval

⁷ L_{A90} refers to the noise level exceeded 90% of the time period, commonly referred to as the background noise level

- (a) before 7a.m, if it makes a noise of more than 3dB(A) above the background level; or
- (b) from 7a.m. to 10p.m, if it makes a noise of more than 5dB(A) above the background level; or
- (c) after 10p.m, if it makes a noise of more than 3dB(A) above the background level

4.3 Assessment

Based on the presented background noise levels in Table 1, above application of the EPA criteria set limiting levels as presented in Table 2, below.

Table 2: Mechanical Plant noise emission Limits

Period	Limiting level
7:00 am to 10:00pm	$27 + 5 = 32 \text{ dB(A) } L_{Aeq}$
10:00pm to 7:00 am	$20 + 3 = 23 \text{ dB(A) } L_{Aeq}$

We note that the nearest noise sensitive location is approximately 560m from possible plant locations. Distance attenuation over this distance is calculated to be 55dB reference to a source level of 1m. The resultant allowable daytime source noise level of 87 dB(A) L_{Aeq} is in excess of expected noise levels from plant appropriate for the proposed amenity area.

Accordingly we consider that no noise treatment is required for mechanical plant.

5.0 INTERMITTENT AND FLUCTUATING NOISE

Intermittent noise is that which is not emitted for extended periods of time. In this instance it refers to the noise from the paintball markers and the noise of game players.

5.1 Criteria

When considering intermittent and fluctuating noise emissions onto adjacent residential premises, there are two appropriate methodologies:

- Day time and evening – Environmental Protection Noise Policy quality objectives;
- Night time – sleep disturbance limits.

As the facility will not be operated at night, Sleep Disturbance methodologies are not applied.

5.2 The Environmental Protection (Noise) Policy

The Environmental Protection (Noise) Policy 2008 established a series of acoustic quality objectives for the emission of noise from intermittent activity. The objectives are presented in Schedule 1 of the Environmental Protection (Noise) Policy 2008. Applicable parts of the schedule are extracted below. If an average façade attenuation of 8 dB(A)⁸ is assumed, the

⁸ This level applies to a façade with open windows and is taken from the results of field measurement

Indoor $L_{Aeq1\text{ hr}}$ criteria equate to the results added to the table (windows open) for exterior noise levels measured at the facade.

Schedule 1 Extract from Acoustic quality objectives EPP (Noise) 2008

Column 1	Column 2	Column 3			Column 4
Sensitive receptor	Time of day	Acoustic quality objectives (measured at the receptor) dB(A)			Environmental value
		$L_{Aeq,adj,1\text{ hr}}$	$L_{A10,adj,1\text{ hr}}$	$L_{A1,adj,1\text{ hr}}$	
Dwelling (for outdoors)	daytime and evening	50	55	65	health and wellbeing
Dwelling (for indoors)	daytime and evening	35 (43)	40 (48)	45 (53)	health and wellbeing

As game play will extend into the evening, noise impacts will be considered against interior limits.

5.3 Paintball Markers

We understand that the paintball markers proposed for the facility are the “Inferno” model manufactured by Arrow Precision Limited. This marker is reported to have noise emissions as per Table 3 below.

Table 3: Paintball Marker Source Noise Level

Action	Noise level
Firing 0.68 cal paintball @ 5m	80 dB(A) L_{Amax}
Firing 0.68 cal paintball @ 10m	77 dB(A) L_{Amax}

From data provided by AJS surveys we expect that up to 1000 paint balls will be discharged in any one game, with a typical game lasting 15 minutes. We calculate a total noise level of 67 dB(A) $L_{Aeq1\text{ hr}}$ at 10m from 2 games every 15 minutes, i.e. 8 per hour.

5.4 Player Noise

Measurement of game play player source noise levels was not possible as suitable sites for measurement were not available. However from data provided by AJS surveys, a similar impact assessment indicates player source noise levels as 57 dB(A) L_{Aeq} at 100m⁹ for a two zone game layout. This level is compatible with Palmer Acoustics data for game player noise for other sports and accordingly is the level used in calculations.

5.5 Calculation considerations

Calculation of marker and player noise impacts onto the nearest noise sensitive location are include the following considerations:

⁹ Noise levels adjusted to a common reference distance.

- Distance to location;
- Duration of games;
- Number of simultaneous games;
- Estimated period of player noisy activity versus stealth periods (90% stealth);
- Shielding effect of the centre site ridge line.

Owing to the intermittent, unpredictable nature of the source i.e. game play, estimates of the L_{A10} noise parameter is not considered practical and is not considered.

Table 4: Predicted noise impact and compliance assessment

Sensitive location	Source	Parameter	Impact DB(A)	Compliance
				EPP objective
Residence R1	Players	L_{A01}	46	Yes (53)
		L_{Aeq}	40	Yes (43)
Residence R2	Players	L_{A01}	41	Yes (53)
		L_{Aeq}	38	Yes (43)
Residence R1	Paint marker	L_{A01}	46	Yes (53)
		L_{Aeq}	39	Yes (43)
Residence R2	Paint marker	L_{A01}	41	Yes (53)
		L_{Aeq}	34	Yes (43)
Residence R1	Total	L_{Aeq}	43	Yes (43)
Residence R2	Total	L_{Aeq}	39	Yes (43)

5.6 Car Parking

Noise from operation of the car park is considered in Table 5 below. Owing to the separation distances noise amelioration treatment will not be required.

Table 5: Predicted car park noise impacts

Source Noise at 10 m	Noise Level dB(A)	Residence	Distance Attenuation	Noise Level dB(A) at Façade	Complies With Noise Limits
Car start and pass by	61 dB(A) L_{A01}	R1	35 dB (10m to 550 m)	26 dB(A) L_{A01}	Yes
Car door slam	64 dB(A) L_{A01}	R1	35 dB (10m to 550 m)	29 dB(A) L_{A01}	Yes
Car start and pass by	61 dB(A) L_{A01}	R2	36 dB (10m to 650 m)	25 dB(A) L_{A01}	Yes
Car door slam	64 dB(A) L_{A01}	R2	36 dB (10m to 650 m)	28 dB(A) L_{A01}	Yes

5.7 Discussion

The noise levels presented in Table 4, above indicate compliance with the requirements of the EPA.

Accordingly we assert that the noise from game play will not be readily discernible or cause nuisance.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Based upon our assessment we conclude:

- Mechanical plant installation is not expected to require noise attenuation treatment;
- Car parking operation will comply with emission criteria;
- Game play will comply with emission criteria.

It is the opinion of Palmer Acoustics (Australia) Pty Ltd that the proposed Paintball Adventure Course complies with the Quality Objectives of the Environmental Protection (Noise) regulations.

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Reviewed by:



ROSS PALMER CPEng
Principal

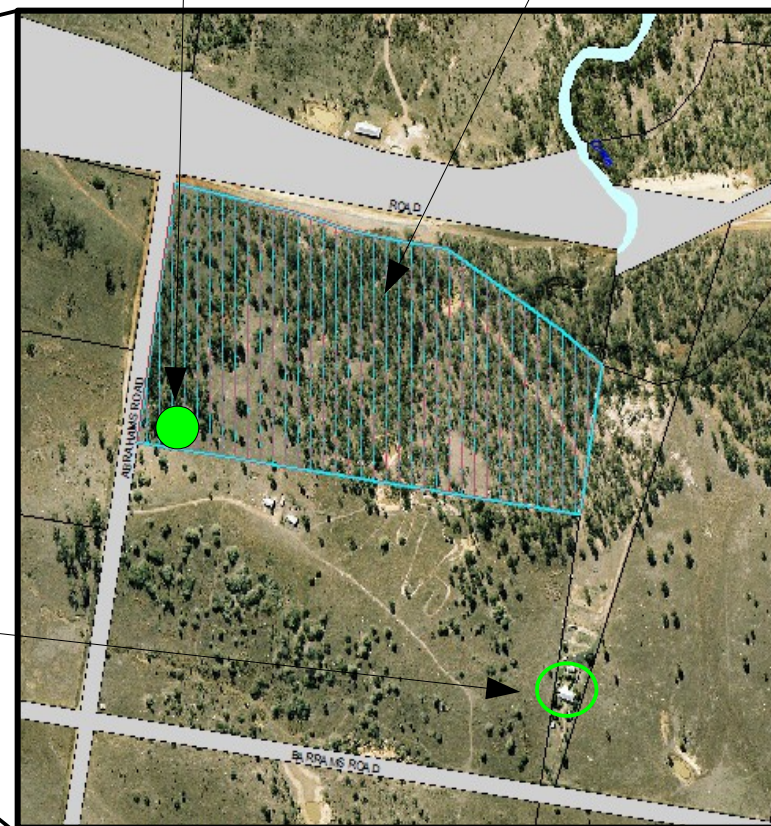


Residence R1

Residence R2

ML1

Development Site





Title	Proposed site layout	Sketch No.	2	Project No.	3441
Project	Proposed Outdoor Sport and Recreation area – Paintball Adventure Course 107 Abrahams Road, South Ripley	Date	October 2012	Scale	NTS
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3441 Proposed Paintball gaming, Sth Ripley Ambient Logging, ML1, 06 August to 12 August 2012

