STATEMENT OF ENVIRONMENTAL EFFECTS

for

LAND USE APPLICATION FOR THE PURPOSES OF A RECREATION FACILITY (OUTDOOR) – PAINTBALL CENTRE

At

312 LONDONDERRY ROAD

LONDONDERRY

Dated October 2014

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CONTENTS.

1.0 INTRODUCTION.

This report constitutes a Statement of Environmental Effects and has been prepared on behalf of Delta Force Paintball to accompany the submission of a Development Application to Penrith City Council made under the *Environmental Planning and Assessment Act 1979.*

The application proposes the use of a portion of the property for the purposes of a recreation facility (outdoor), particularly a paintball centre. To facilitate the establishment of the recreation facility, a 120m² structure is to be erected to provide a "basecamp", an ablution block will be installed availing on-site amenities in close proximity to the paintball centre, and an existing car parking area will be refurbished to provide on-site parking in accordance with Council requirements. The paintball centre will be limited to the western portion of 312 Londonderry Rd, Londonderry (the "subject site"), whilst the remainder of the property will continue to be utilised for the purposes of the Richmond Greyhound Track and associated facilities.

The application also seeks Council as the 'prescribed authority' to vary the restriction on the use of the area adjacent to the watercourse as identified in the 88B Instrument applicable to the site. Whilst the proposed works are minor in scale, requiring only the construction of a timber bridge over the watercourse, the application requires a variation to the restriction.

A pre-lodgement meeting has been held with Council officers. A copy of the prelodgement advice is attached at Annexure A.

1.1 Paintball Overview

Paintball is a recreational game based on combat activities. The game is played by multiple players who, in a safe and managed environment, shoot paintballs at each other using specifically designed paintball guns. When players are shot they are declared out of the game. The basic goal of the game is to remove players and capture the opponents' flag and return it to the home base.

The paintballs are comprised of non-toxic, biodegradable, water-soluble polymer and are shot from a "paintball marker".

The game can be played by up to 150 persons, and is played over courses or (fields), which are generally established in bushland settings affording a natural terrain with various obstacles to simulate a particular scenario. The game is highly regulated, requiring players to wear protective masks, body armour and combat suit with high padded collar, with game rules strictly enforced, protecting the safety of all players.

This application is being submitted by Delta Force Paintball. Delta Force have been operating for over 25 years in countries across the world including Australia, the UK, Ireland, New Zealand and Canada, and have a 100% safety

record. Delta Force Paintball have established a number of highly regarded and successful paintball facilities in Australia including Dingley in Victoria, Bonneys and Muchea in Western Australia and Appin, NSW. The extensive experience of company ensures the success of the new facility at Londonderry, whilst maintaining the safety of players and the implementation of proven environmental maintenance measures.

1.2 Scope.

The purpose of this report is to:

- Define the site & describe existing development.
- Describe the proposed development and the locality in which it is situated.
- Discuss Statutory Controls governing the development.
- Discuss the potential environmental effects of the proposal.
- Draw conclusions as to whether those impacts are significant.
- Make a recommendation to Council as to whether the proposed development described in this development application should be supported.

1.3 Annexures.

This report is to be read in conjunction with the following accompanying material

- Shed plans, ablution block plans, site plan
- Development Application Form
- Waste Management Plan
- Acoustic Assessment by Day Design Pty Ltd
- Flora and Fauna Assessment prepared by Envirotech Pty Ltd
- Estimated Cost Summary
- Management Plan
- Paintball Material Data Sheet
- Traffic Report prepared by ML Traffic Engineers

2.0 SITE DESCRIPTION.

2.1 Legal Description.

The site is legally described as Lot 1 in Deposited Plan 1084891. The property is located within the Penrith City Council Local Government Area.

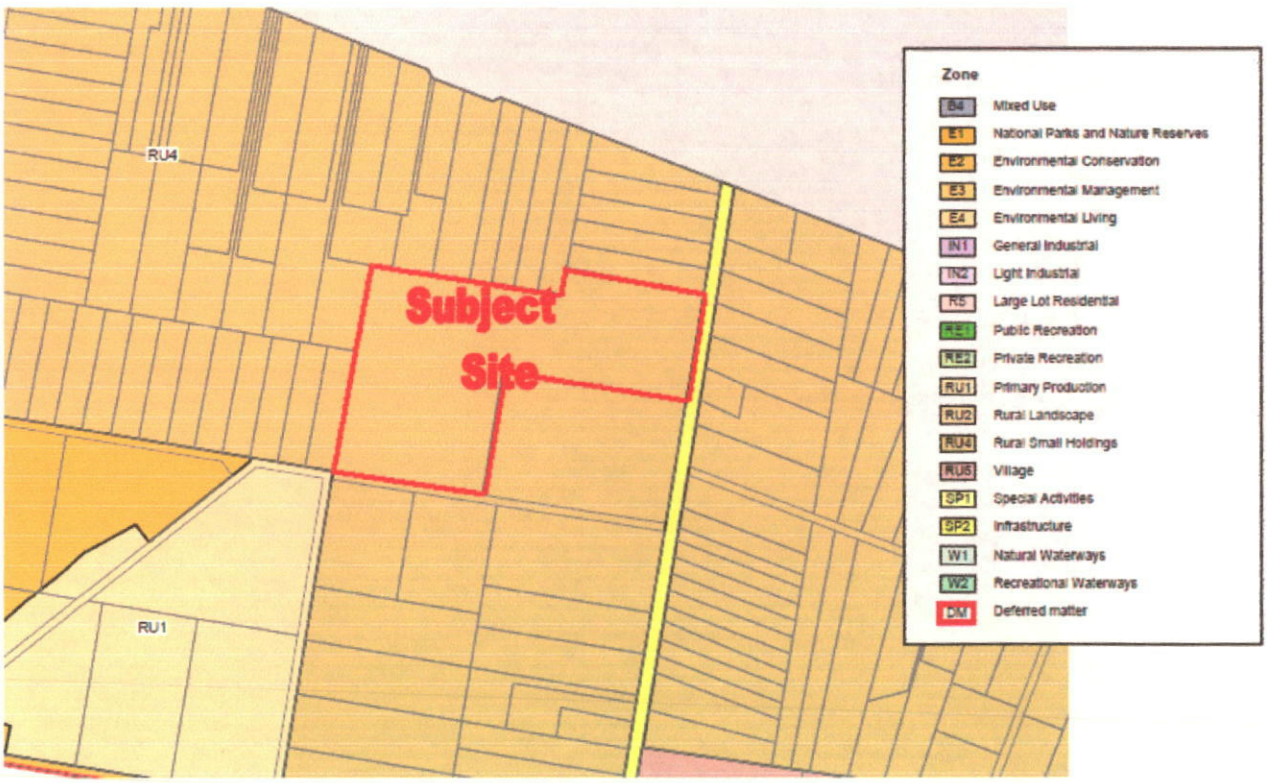
2.2 Site location.

The site is located within the Londonderry rural precinct. More specifically, the allotments are located on the northwest corner of the intersections of Londonderry and Wilshire Roads.

Site Locality from streetdirectory.com.au

2.3 Zoning.

In accordance with Penrith Local Environmental Plan 2010, the site is identified as being zoned RU4 – Primary Production Small Lots.



Site location from PLEP zoning map LZN_10

Surrounding sites and properties within the Londonderry region generally, are dominated by domesticated animal land uses, particularly animal boarding and training facilities.

2.4 Physical Description.

The subject application relates to the construction of a 120m² shed and installation of an ablution block to be used in conjunction with a Paintball facility sited over Lot 1 DP 1084891.

Lot 1 is "L" shaped, having dual road frontages. The primary frontage of the site is to Londonderry Rd, which is identified as being a 'classified road'. Boundaries provide for a 262.218m frontage to this arterial, and a secondary frontage to Wilshire Road of 369.789m. The northern boundary creates a maximum property length of 806.789m. The site area totals 29.82ha.

As described in the Flora and Fauna Assessment which accompanies the application, the rear portion of the site contains the Castlereagh Ironbark Forest. The DP for the property notes a 'restriction on the use of the site' relevant to this vegetation. The prescribed authority to this restriction is Penrith City Council, and therefore we request a variation to the restriction, to permit the proposed development.

Further, an ephemeral watercourse dissects the subject property and adjoining Lot 2. This natural watercourse feeds from the overflow of a large dam located on the subject allotment.

The DP also notes the site has the benefit of a Right of Carriageway. This ROW of variable width appears over adjoining Lot 1 DP 29321 which neighbours the northern boundary.

Landform of the allotment and the precinct generally is relatively level.

2.5 Access.

Access to the site has been established from the Londonderry Rd frontage. Londonderry Rd is an arterial road, providing one of the main routes between Richmond and Penrith.

Due to the existing use of the site as a Greyhound Racing Facility, separate ingress and egress points have been created. These access points are approximately 8m wide and sealed in their width.

Access leads to a large bitumen carparking area which is located at the northeast corner of the property. Internal driveways have been created throughout the site, providing access to the various amenities and areas

throughout the facility. The majority of these driveways have been sealed to afford all-weather use.

Access to the paintball facility is to utilise one of these existing sealed routes which leads past the main racing facility, and leads towards the natural watercourse. It is proposed that this route will be extended to an existing car parking area which is to be upgraded, and which will have provision for the parking of up to 50 vehicles.

Proposed site layout

3.0 EXISTING DEVELOPMENT.

The site has been utilised for racing events since 1912, where it initially held galloping and trot meetings, with the first meeting occurring on 17 December 1912. The club has continually operated as a racing facility since that date, with the exception of a period during the great depression between 1931-35.

Greyhound racing commenced at the facility in October 1955, with the final harness racing event occurring on 30 December 1997. As it currently stands, the facility operates under the name of Richmond Race Club Ltd and conducts 103 greyhound meetings annually.

Development of the property is currently limited to the northeast corner and includes a:

- A fully enclosed grandstand and outside viewing area;
- Private function room within the grandstand catering for up to 100 patrons;
- Administration tower for racing which houses telecast and broadcast facilities, judges room and stewards control centre.
- Administrative offices, totalisator and bar facilities located beneath the grandstand;
- Fully covered bookmakers ring and take-away kiosk;
- Loam greyhound trail track;
- Fully sealed carparking facilities.

This application does not seek alterations to any of the above development or facilities.

4.0 PROPOSED DEVELOPMENT.

The application seeks Council consent for the establishment of a recreation facility (outdoors) – Paintball facility, and construction of associated amenities.

"HOME BASE"

The application proposes the construction of a 15m x 8m colorbond shed to be as "home base" or headquarters, providing amenities for players. The 120m² structure will be utilised to store safety equipment which is supplied to each player on arrival, will provide a small refreshment area selling food and drink, and will have a locker area dedicated to the storage of player's personal possessions.

This structure will also be used to provide the essential health and safety speech which details the rules and regulations of the day and demonstrates how to use the equipment which.

Home base is to be constructed to the west of the racing track on an east to west axis and will have a maximum height at the ridge of 3.5m. The shed is to be constructed in earth tones (Wilderness Green) to blend with the surrounding environment and will be provided with pedestrian access from the newly created carpark. The shed includes a number of roll-a-doors which will provide natural ventilation and light to the internal areas. An attached awning, running the length of the shed will provide additional covered space for associated activities.

ABLUTION BLOCK

An ablution block is to be sourced and installed, providing convenient amenities for both staff and patrons. This amenity building is to be installed to the west of "base camp" and will include 2 female toilets and 2 male toilets plus urinal. Wastewater generated from the amenities will be diverted to the existing on-site wastewater treatment system which currently services the Greyhound Racing facility.

FIELDS

The application requires the establishment of a total of 6 playing fields. These areas are approximately 4000m² and will be roped to define each playing field. A total of 2 Rejuvenation areas are to be established. These fields are to be utilised on a rotational basis, allowing the vegetation in disused fields to regenerate. This rotational basis has proven successful with other such operations, and is in accordance with the Flora and Fauna Report which forms part of the application.

MARKER STORAGE

In accordance with the Firearms Act 1996, Level 3 (Safe Storage of Firearms), the paintball guns are required to be stored in a locked, secured area each evening. To ensure compliance, the application proposes the disused boarding kennels located at the west of the greyhound facilities, will be used for storage purposes.

The guns are to be transferred each day, at the end of play, to the kennels where they will be secured overnight in appropriate secure storage facility and collected the following morning. The storage facility is required to be inspected and approved by NSW Police, at which time a certificate will be provided.

CARPARK

An existing, disused car parking area is to be upgraded to an all-weather surface to provide parking for up to 50 vehicles. The carpark will connect to an existing internal driveway which leads to the rear of the Greyhound Racing facility.

Further, a traffic report commissioned by Delta Force has been prepared by ML Traffic Engineers and forms part of the application.

SIGNAGE

The application also seeks Council consent for the installation of identification signage.

The 1220 x 2400 pole mounted "V" Frame sign is to be erected at the southern end of the Londonderry Rd frontage.

FENCING

Internal fencing will be installed to prevent stray paintballs entering the basecamp areas and to protect vehicle access routes. Fencing consisting of chain wire mesh covered with shade cloth netting will be strategically placed:

- **base camp fencing will be 1.8m facing away from the game zones**
- **base camp fencing will be 3.6 m facing the game zones**
- **fencing across the northern boundary along the driveway will be 3.6m.**

OPERATIONAL DETAILS

Days/Hours of operation: Monday to Sunday; 9am-4pm

Staff numbers: Total 10: (1x Centre Manager; 1x Base Camp Marshall; 8 x Game Zone Marshalls)

Anticipated number of users (daily): 150/ day

General operational details

- Patrons arrive around 8:30 and are marshaled into the car park area.
- Once they have parked in their assigned car space they are directed into the base camp where they are registered and issued with coveralls, protective body armor and paintball canisters
- Once all the players have been registered they are split into teams of around 10-15 people, which are identified by coloured arm bands.
- The Centre Manager will conduct the safety briefing and ensure all players understand the rules, their obligations, instruction on using the equipment and a general run down of the day.

- Each team is assigned a marshal who will stay with them throughout the entire day. With two teams playing one another, this means that each game zone will always be attended by at least two marshals to supervise proceedings, enforce the safety rules along with scoring, tactical advise and to ensure everyone is having a great time.

- At the start of the day, the paintball markers are removed from the secure store by qualified marshals and taken to an onsite firing range where they are prepared and tested for the day's activities; they remain under constant supervision.

- Once all safety equipment is fitted by the players and checked by the qualified marshals, players enter the game zone arena and are issued with their designated paintball marker.

- Each game zone will have different demountable or natural barriers themed to a variety of paintball scenarios. There will be distinct pathways between the base camp and each game zone for players to be escorted on and perimeter roping, fencing (or similar) clearly defined for player orientation.

- Each game zone area will be roped off prior to the commencement of games. Buffer areas of 100m from the edge of each skirmish area will be contained entirely inside the subject lands. The range of the paintball markers have an upper limit of 80m.

- It is proposed that game zone usage will be rotated to provide a variety of activities and ensure that no particular section of the site is over used.

- Each paintball game generally lasts about 15-20 minutes. The common objective and specific rules associated with the specific game zone are explained by the marshals and players are directed to their starting positions. Teams will begin at opposite ends of the game zone with a whistle initiating and concluding the game. Players will try to 'mark' their opponents in working towards the game's objective with 'marked' players leaving the game zone to a designated 'dead zone' where they will remain until the conclusion of the game.

- Groups will play 2 games on each game zone before returning to the base camp for a short 5 minute break allowing for an equipment check, re-load of paintballs and refreshments. A 45-minute lunch break is scheduled at approximately 1pm before afternoon games continue.

- Examples of game scenarios include "Capture the Flag", "Claim the Crypt", "London after the Apocalypse", "Assassinate the President".

- At the end of the day, a presentation ceremony occurs with results of the day's play announced and awards presented. Patrons depart soon after and the facility and equipment are cleaned and checked.

Food/drinks offered:

- Pre-packaged snacks such as chocolate bars, and potato chips Schweppes soft drink, water and sports drink ranges

OTHER MATTERS

An assessment as to noise impact associated with the development has been undertaken by Day Design Pty Ltd. The report is attached to and forms part of the application. Recommendations contained within the report include the use of specific materials (shade-cloth, wood or rubber) for game zone structures as well as the implementation of administrative techniques such as the erection of signage to limit patron and employee noise whilst in the game zone.

88B INSTRUMENT

An 88B instrument applicable to the site restricts works in close proximity to the natural watercourse.

Works within the prescribed area are limited to the construction of a timber pedestrian bridge connecting the base camp to the gaming zones. The bridge will be setback 1m from the watercourse thus eliminating the potential for bank erosion and impact to water flows.

As a result of the need to provide pedestrian access over the watercourse, a variation to the 88B instrument is required, permitting the installation of the bridge. As the 'prescribed authority', Penrith City Council are able to consent to the proposal.

5.0 DEVELOPMENT CONTROLS..

The Environmental Planning & Assessment Act, specifically Section 79, and related Legislation which are considered to control development on the site are;

5.1 Penrith Local Environmental Plan 2010 (PLEP 2010)
5.2 Penrith City Council Development Control Plan (DCP) 2010
5.3 State Environmental Planning Policy No. 64 Advertising and Signage
5.4 The Disability (Access to Premises-Buildings) Standards 2010

5.5 Environmental Planning & Assessment Act. 1979

5.1 PENRITH LOCAL ENVIRONMENTAL PLAN 2010

Penrith Local Environmental Plan 2010 applies to the land and came into effect on 22 September 2010.

In accordance with this environmental planning instrument, the subject site is zoned RU4 – Primary Production Small Lots.

Part 2 Permitted or prohibited development

Zone RU4 – Primary Production Small Lots

1 Objectives of zone

- *To enable sustainable primary industry and other compatible land uses.*

The site is currently utilised as a greyhound racing facility. The proposal is considered an extension of this use, providing further recreational uses of the site. Given the long-standing establishment and use of the greyhound racing facility, it is considered that an extension of the recreational use of the property is befitting in this location.

- *To encourage and promote diversity and employment opportunities in relation to primary industry enterprises, particularly those that require smaller lots or that are more intensive in nature*

The application seeks Council consent for the construction of a purpose built structure and use of a small portion to the rear of the site for the purposes of a recreation facility (outdoors). The nature of the development will require permanent staffing, employing 10 staff on a permanent basis. Whilst the proposal does not strictly fall within the realms of 'primary industry enterprise', the generation of employment opportunities in conjunction with the provision of a facility which benefits the public and community generally, is considered to have positive impact on the locality.

- *To minimise conflict between land uses within this zone and land uses within adjoining zones*

The site is currently utilised for recreational activities, with the proposal increasing this approved and successful land use. Further, extensive studies have been undertaken to ensure the proposal will not impact on the amenity of the precinct.

The paintball facility will have minimal impact to adjoining land uses, being relatively obscured from view from neighbouring sites and public spaces.

- *To ensure land uses are of a scale and nature that is compatible with the environmental capabilities of the land*

The site is currently utilised for greyhound racing activities, with the proposal providing further recreational activities in this locality.

Services required to be extended to the paintball centre include electricity and telephone, both of which are currently available to the immediate area. Water will be harvested and collected to rainwater storage tanks for use in the development, and wastewater will be treated and disposed of on-site by the existing system.

It is therefore considered, taking into account the findings of the Flora and Fauna Assessment and Traffic study which accompanies the application, that the proposal complies with this zone objective, having minimal impact on the environmental and capabilities of the land.

- *To preserve and improve natural resources through appropriate land management*

The Flora and Fauna Report prepared for the proposal addresses this objective.

Permitted with Consent

The proposal is classified as an "*Recreation Facility (outdoor)*" being *a building or place (other than a recreation area) used predominantly for outdoor recreation, whether or not operated for the purposes of gain, including a golf course, golf driving range, mini-golf centre, tennis court, **paint-ball centre**, lawn bowling green, outdoor swimming pool, equestrian centre, skate board ramp, go-kart track, rifle range, water-ski centre or any other building or place of a like character used for outdoor recreation (including any ancillary buildings), but does not include an entertainment facility or recreation facility (major)*". Recreation facility (outdoor), as particularly identified, **paint ball centres** are permitted development in the RU4 zone.

Part 4 Principal Development Standards

Clause 4.3 Height of Buildings

Penrith LEP 2010 does not impose restriction to the height of buildings on the subject site.

Clause 4.4 Floor Space Ratio

Penrith LEP 2010 does not impose restrictions as to floor space ratio on the subject site.

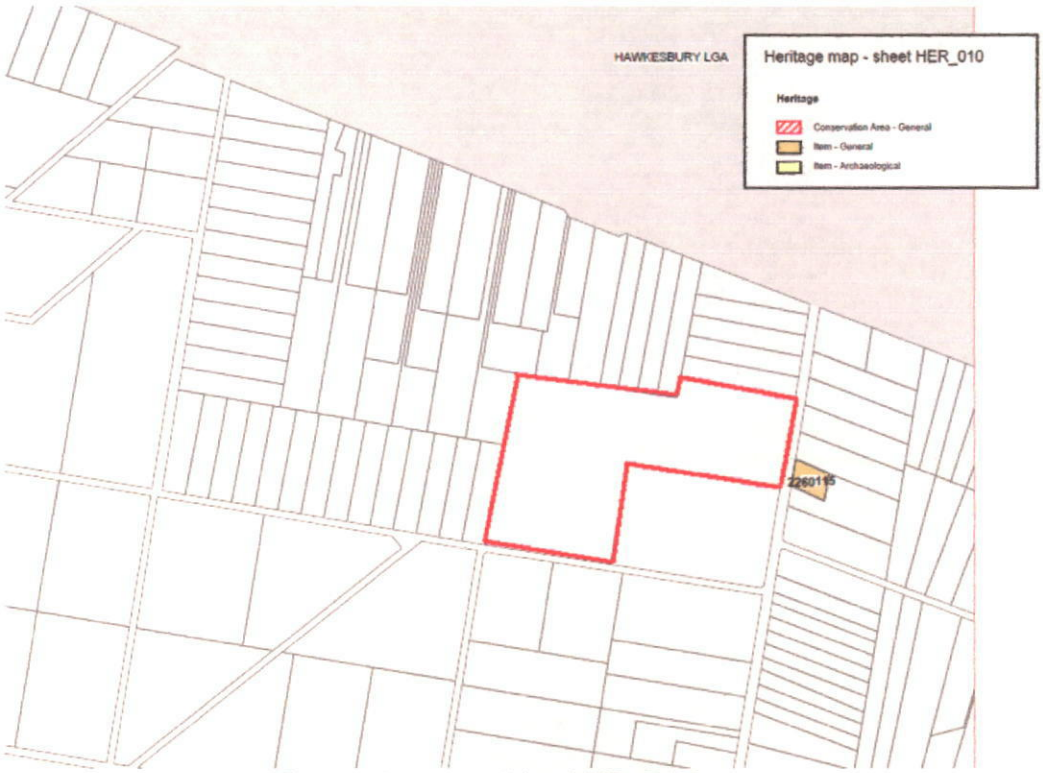
Part 5 Miscellaneous Provisions

Clause 5.9 Preservation of trees or vegetation

A Flora and Fauna Assessment relative to the proposal has been prepared by Envirotech Pty Ltd. A copy of the report is attached to the application and addresses this issue.

5.10 Heritage Conservation

In accordance with Penrith LEP 2010, heritage item 2260115, identified as "Londonderry Cemetery 325-331 Londonderry Rd, Lot 100 DP 810236" is located opposite the subject site.



Extract Heritage Map HER_010

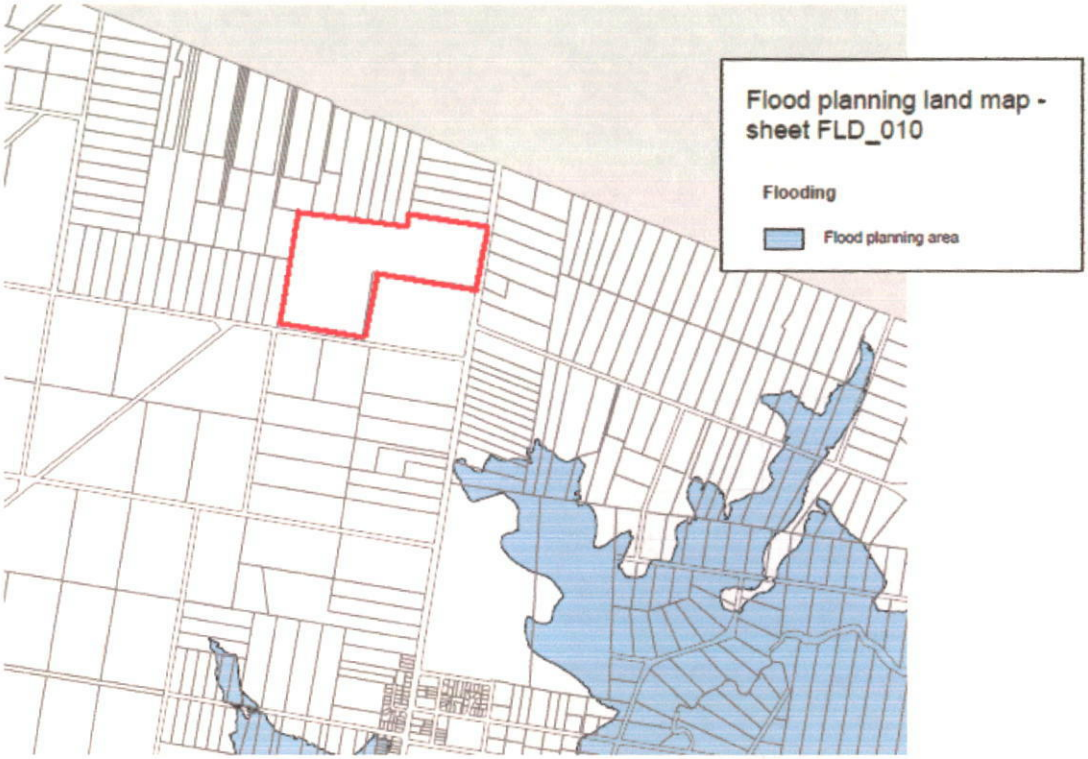
The proposal will have negligible impact on the heritage item and its significance. The building is to be located in excess of 600m from this heritage item and, due to existing development and native vegetation will not be visible from the cemetery. This extensive setback, coupled with the natural and built environment will ensure the proposal will not impact on the heritage significance of the item.

It is a conclusion of this report that impact on the heritage listed "Londonderry Cemetery" will be negligible.

Part 6 Additional local provisions

Clause 6.3 Flood Planning

The subject site does not fall within the area identified as being affected by flood planning controls, therefore this clause is not a consideration for the proposal.



Extract Flood Planning Map FLD_010

Clause 6.4 Development on natural resource sensitive land

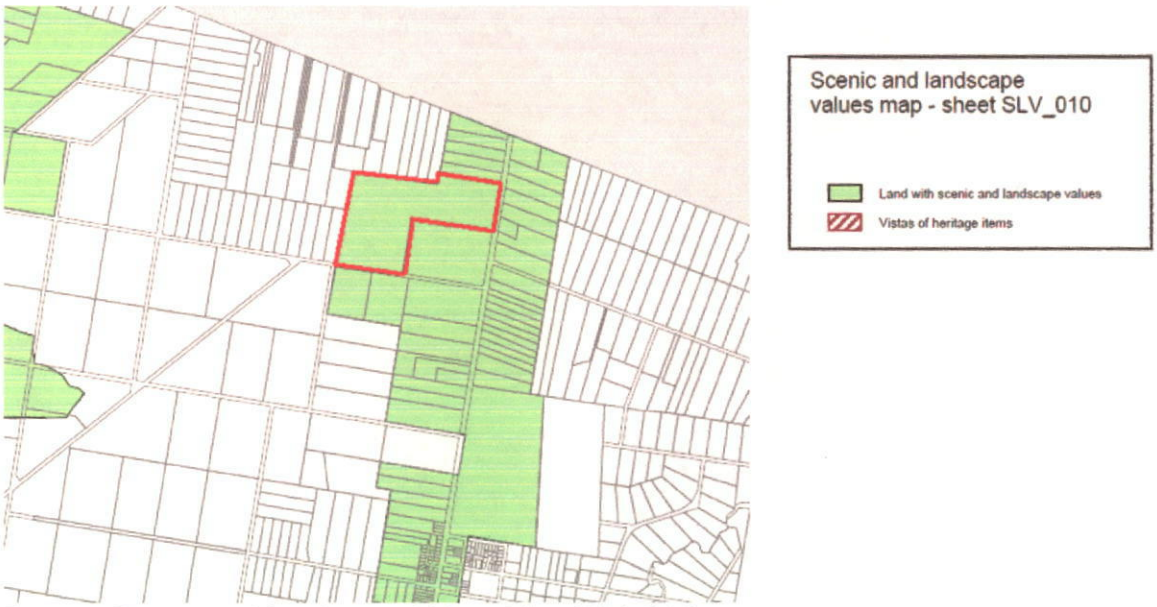
In accordance with Map NRL_10 (excerpt below), the rear of the subject site is classified as natural resource sensitive land. The Flora and Fauna Report prepared by Envirotech provides identifies this area as containing Cooks River Castlereagh Ironbark Forrest and Castlereagh Scribbly Gum Woodland. This report provides recommendations to ensure the preservation and management of this vegetation.

Further the ecologists undertaking the report have recommended changes to the proposal, particularly in relation to portions of the site which are to remain undisturbed. This advice has been implemented and changes to the application made accordingly.

Excerpt Natural Resource Sensitive Map NRL_010

Clause 6.5 Protection of scenic character and landscape values

The rear of the site is classified as having scenic and landscape values in accordance with SLV_010 (except below).



Excerpt Scenic and Landscape Values Map SLV_010

It is not anticipated that the proposal will negatively impact on the scenic character of the area. The proposed physical development is to be located towards the rear of the site, which existing built form-providing screening to the new works.

The scenic and landscape values are further protected through the implementation of the recommendations made in the Flora and Fauna Assessment prepared by Envirotech.

5.2 PENRITH DEVELOPMENT CONTROL PLAN 2010.

The document came into force on 10 December 2010 and applies to Penrith's rural lands, industrial lands and the St Marys Town Centre to support Penrith Local Environmental Plan 2010.

The DCP contains the various policies & guidelines affecting development proposals within Penrith.

The proposed development has been considered in relation to the relevant chapters of the DCP. An assessment of those requirements follows:

PART C – CONTROLS APPLYING TO ALL LAND USES

C1 – SITE PLANNING AND DESIGN PRINCIPLES

C2 VEGETATION MANAGEMENT

A Flora and Fauna Assessment prepared by Envirotech accompanies the application.

C9 ADVERTISING AND SIGNAGE

The proposed signage is best described as "business identification sign". The application proposes the installation of a 1.22m x 2.4m business identification sign at the site frontage. The sign is to be a pole mounted "V Frame" sign and will display the Delta Force company logo, together with contact details and identify the entrance point to the facility.

Consideration of suitability of the signage and compliance with SEPP 64 requirements is provided below.

C10 TRANSPORT, ACCESS AND PARKING

Access to the site has been established from the Londonderry Rd frontage. Londonderry Rd is an arterial road, providing one of the main routes between Richmond and Penrith.

Due to the existing use of the site as a Greyhound Racing Facility, separate ingress and egress points have been created. These access points are approximately 8m wide and sealed in their width.

Access leads to a large bitumen car parking area which is located at the northeast corner of the property. Internal driveways have been created throughout the site, providing access to the various amenities and areas throughout the facility. The majority of these driveways have been sealed to afford all-weather use.

Access to the paintball facility is to utilise one of these existing sealed routes which leads past the main racing facility, and leads towards the natural watercourse. It is proposed that this route will be extended to an existing car parking area which is to be upgraded and which will have provision for the parking of up to 50 vehicles.

Suitability of the proposed access and parking arrangement to sufficiently cater for the proposal have been addressed in the Traffic and Parking Impact Report prepared by ML Traffic.

5.3 STATE ENVIRONMENTAL PLANNING POLICY NO. 64 ADVERTISING AND SIGNAGE.

The application proposes the installation of a 1.22m x 2.4m business identification sign at the site frontage. The sign is to be a pole mounted "V Frame" sign and will display the Delta Force company logo, together with contact details and identify the entrance point to the facility.

The proposed signs fall under Part 2 Signage Generally of this policy as they are best defined as a 'building identification' sign under the provisions of SEPP No. 64.

'Building identification sign' means "*a sign that identifies or names a building, and that may include the name of a business or building, the street number of a building, the nature of the business and a logo or other symbol that identifies the business, but does not include general advertising of products, goods or services.*"

Under SEPP No.64 Part 2 Signage Generally, "A consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied:

(a) that the signage is consistent with the objectives of this Policy as set out in clause 3(1) (a), and

(b) that the signage the subject of the application satisfies the assessment criteria specified in Schedule 1."

An assessment of the proposal against the aims of this policy and the assessment criteria specified in Schedule 1 follows:

Aims objectives, etc

(1) This policy aims:
(a) to ensure that signage (including advertising):
(i) is compatible with the desired amenity and visual character of an area, and
(ii) provides effective communication in suitable locations, and
(iii) is of high quality design and finish, and
(b) to regulate signage (but not content) under part 4 of the act, and
(c) to provide time limited consents for the display of certain advertisements.

(2) this policy does not regulate the content of signage and does not require consent for a change in the content of signage.

The proposed signage is compatible with the amenity and visual character of the locality. It is considered that the newly proposed signage is consistent with that of the signage currently displayed at the site frontage for the Richmond Greyhound Racetrack.

Schedule 1 of SEPP No. 64 provides the 'assessment criteria' that needs to be considered for an application for signs:

1. Character of the area
Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?
Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?

The aim of signs contained within rural zones of the locality is to permit adequate opportunity to display and identify the nature of activities being carried out on the land to which the sign is erected. The proposal is not considered to have an adverse visual impact on the existing character of the area.

2. Special areas
Does the proposal detract from the amenity or visual quality of any environmentally sensitive area, heritage area, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?

The size and location of the signage is consistent with existing signage currently displayed at the street frontage. It is considered that the proposal will not have a significant adverse impact on the neighbouring rural/residential developments or have an adverse impact on the amenity or quality of the locality.

3. Views and vistas
Does the proposal obscure or compromise important views?
Does the proposal dominate the skyline and reduce the quality of vistas?
Does the proposal respect the viewing rights of other advertisers?

The proposal does not obscure or compromise important views. It is considered that the proposal will not dominate the skyline or reduce the quality of vistas.

4. Streetscape, setting or landscape

Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?
Does the proposal contribute to the visual interest of the streetscape, setting or landscape?
Does the proposal reduce clutter by rationalizing and simplifying existing advertising?
Does the proposal screen unsightliness?
Does the proposal protrude above buildings, structures of tree canopies in the area or locality?

The scale, proportion and form of the proposal is appropriate for the streetscape and setting. The proposal does not deter from the visual interest of the streetscape. The sign will not protrude above buildings, structures or tree canopies in the area;

5. Site and building

Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?
Does the proposal respect important features of the site or building, or both?
Does the proposal show innovation and imagination in its relationship to the site or building, or both?

The proposal is compatible with the scale, proportion and other characteristics of the existing Greyhound Racing Track and ancillary structures.

6. Associated devices and logos with advertisements and advertising structures?

Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?

The application proposes the installation of a pole mounted "V" Frame sign. The sign is to display the Delta Force company logo, together with contact details and identify the entrance point to the facility.

The size and content of the sign is considered appropriate to the proposed use of the site. No additional features are included with the signage structure.

7. Illumination

Would illumination result in unacceptable glare?
Would illumination affect safety for pedestrians, vehicles or aircraft?
Would illumination detract from the amenity of any residence or other form of accommodation?
Can the intensity of the illumination be adjusted, if necessary?

Is the illumination subject to a curfew?

No illumination of the sign is proposed.

8. Safety

Would the proposal reduce the safety for any public road?
Would the proposal reduce the safety for pedestrians or bicyclists?
Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?

The proposed signage will not reduce safety, due to its location and nature. Further the site has an extensive street frontage to Londonderry Road, ensuring adequate sight distances to drivers and pedestrians. The sign is to be located entirely within the property boundaries and do not protrude over any pedestrian areas or public roads.

Conclusion:
It is considered that the proposed signage complies with the aims, objectives and Schedule 1 provisions of SEPP 64.

5.4. DISABILITY (ACCESS TO PREMISES-BUILDINGS) STANDARDS 2010

The Disability (Access to Premises-Buildings) Standards 2010 aim to achieve better access to a wider range of public buildings. Improving building access gives more people more opportunity to access employment, education and services, and to connect with the broader community.

The paintball facility encourages and accommodates all persons, having measures in place in the instances of rough terrain or inaccessible bushland areas, participants are put into a strategic and well-protected position prior to commencement of the game.

Access to all other areas within the facility are of sufficient grade and accessibility to ensure compliance with this Standard.

5.5. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Section 79C Evaluation

(1) Matters for consideration--general

Matters for consideration—general

In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

(a) the provision of:

(i) any environmental planning instrument, and
(iii) any development control plan, and
(iv) the regulations,
that apply to the land which the development application relates,

This Statement addresses all of these items in detail.

(b) the likely impacts of that development , including environmental impacts on both the natural & built environments ,& social & economic impacts in the locality,

The proposal is infill development & will not adversely impact on the natural or built environment.

It is considered that there will be social benefits resulting from the development, including the provision of alternative recreational facilities in the Penrith LGA. Further, the development will benefit the community economically, encouraging visitors to the area, and creating increased employment opportunities to local residents.

The proposal will continue to provide a recreational use of the site which is located in close proximity to public services & utilities.

(c) the suitability of the site for the development.

The site & surrounding locality do not present any significant physical, ecological or social constraints on the development of the site for recreational activities.

There is no evidence to support that the site is or has ever been used in a manner that would cause the site to become contaminated. It is therefore considered that the site is not contaminated.

It is considered that the proposed development will not affect the local road system beyond the capacity of the road network.

(e) the public interest.

It is considered that the development is in the interest of the public as it provides for an increased recreational site use, contributing to the social and economic fabric of the Penrith LGA.

6.0 CONCLUSION.

The aim of this report has been:

- To describe the proposal.
- To illustrate compliance of the proposed development with relevant statutory considerations; and

- To provide an assessment of the likely environmental effects of the proposal

The proposal satisfies the relevant Council planning objectives and policies, State Planning Policies and provisions of the Environmental Planning and Assessment Act, 1979.

The development 312 Londonderry Rd, Londonderry will have a positive impact on the locality.

PENRITH

Our Ref: PL14/0074
Contact: Gavin Cherry
Telephone: (02) 4732 8125

14 August 2014

T Wilson
1/45 The Avenue
WICKHAM NSW 2293

Dear Mr T Wilson,

Pre-lodgement Meeting
Proposed Paintball Facility (Recreation Facility – Outdoor)
Lot 1 DP 1084891, 308-332 Londonderry Road LONDONDERRY NSW 2753

We welcome your initiative to commence your project in the Penrith Local Government Area.

Thankyou for participating in Council's pre-lodgement meeting on . We consider that the pre-lodgement process will assist in the preparation and determination of your proposal.

If you require any further assistance regarding the attached advice please contact me on (02) 4732 8125.

Yours faithfully

Gavin Cherry
Principal Planner

**** Important Note ****

The pre-lodgement panel will endeavour to provide information which will enable you to identify issues that must be addressed in any application. The onus remains on the applicant to ensure that all relevant controls and issues are considered prior to the submission of an application.

Information given by the pre-lodgement panel does not constitute a formal assessment of your proposal and at no time should comments of the officers be taken as a guarantee of approval of your proposal.

It is noted that there is no Development Application before the Council within the meaning of the *Environmental Planning and Assessment Act 1979*. This response is provided on the basis that it does not fetter the Council's planning discretion and assessment of any Development Application if lodged. It is recommended that you obtain your own independent expert advice.

The response is based upon the information provided at the time of the meeting.

Penrith City Council
PO Box 60, Penrith
NSW 2751 Australia
T 4732 7777
F 4732 7958
penrithcity.nsw.gov.au

PENRITH
CITY COUNCIL

PROPERTY AND PLANNING INFORMATION	
Attendees	**Proponent** Tony Wilson Leon Bubenicek **Penrith City Council** Gavin Cherry – Principal Planner Jenna Hore – Biodiversity Officer Steve Masters – Senior Development Engineer Craig Squires – Fire Safety Coordinator Chris Martyn – Planning Administration Carlie Fulton – Senior Environmental Health Officer
Proposal	Paintball Facility (Recreation Facility – Outdoor)
Address	Lot 1 DP 1084891 , 308-332 Londonderry Road LONDONDERRY NSW 2753
Zoning and permissibility	The subject site is zoned RU4 – Primary Production Small Lots and a recreation facility – outdoor (which specifically references paintball) is a permissible land use on the site under the provisions of LEP 2010 subject to development consent from Council.
Site constraints	— Bushfire — Flooding and Overland Flow — Endangered Ecological Community — Tree Preservation — Easements & 88B Restrictions (restricted works in close proximity to watercourse) — Watercourse and nominated integrated / controlled activity requirements
Development Type	— Potential Nominated Integrated Development if works are proposed within 40m of the watercourse and those works require a controlled activity permit from the NSW Office of Water under the provisions of the Water Management Act 2000.

KEY ISSUES AND OUTCOMES

The proposal is to address the following issues:

RELEVANT EPI's POLICIES AND GUIDELINES

Planning provisions applying to the site, including permissibility and the provisions of all plans and policies are contained in **Appendix A**.

PLANNING

- There is a currently an 88b restriction along the watercourse which does

Threatened Species Assessment (2005).

- The site is mapped as containing Cooks River Castlereagh Ironbark Forest (Endangered under the NSW Threatened Species Conservation Act 1995) and Castlereagh Scribbly Gum Woodland (Vulnerable under the NSW Threatened Species Conservation Act 1995). The site is also likely to contain *Dillwynia tenuifolia*, a Vulnerable species under the NSW Threatened Species Conservation Act 1995. This may influence the layout of the playing fields. Areas of 'good condition' vegetation should be considered, as should key habitat features.

- All bushland on the site is identified as a Priority Conservation Land under the Cumberland Plain Recovery Plan. Council is required to have consideration of this when assessing an application. The applicant should minimise any impacts on the vegetation wherever possible. This may include relocating playing fields to more disturbed areas.

- The site is mapped as Natural Resource Sensitive Lands under the 2010 LEP. The applicant is to ensure that they can address the objectives of this zone and retain vegetation as much as possible (including trees, shrubs and ground covers).

- If there is any potential for the site to be used for night activities then consideration should be given to impacts on nocturnal fauna. Lighting and noise should also be considered.

- The Ecological assessment should also considered potential further playing field areas, or reserve playing field areas and potential impacts on these areas.

- Erosion and soil compaction impacts in the bushland should be considered. Consideration should be given to the impacts of erosion and soil compaction on tree roots.

BUILDING REQUIREMENT

- The Access to Premises Standard is to be addressed ensuring that both access into and around the premises / activity, as well as amenity provision complies with accessibility requirements under the premises standard, BCA and DDA. Specific information should also be provided addressing course accessibility provision and spectator areas (if proposed).

- The site is mapped as bushfire prone land however the use is not listed as a 'special fire protection purpose' under clause 100(b((6) of the Rural Fires Act 1997.

- If the structure exceeds 500sqm in floor area a fire hydrant would be required to be provided.

- Fire extinguishers and exit signs required.

Noise

- Depending on the intensity of the use proposed, information needs to be provided to address that the use will have no adverse impact on nearby residents, considering all noise generating activities (including all noise generating activities on the site such as the use of the driveway, carpark facilities, traffic, plant and equipment (including PA systems), use of paintball guns, and noise from participants and spectators). This may include information regarding the vehicle movements (particularly using the northern driveway) and noise (measurements) from the paintball guns, and take the form of a statement from a qualified consultant. Should Council have further concerns, an Acoustic Report may be requested to demonstrate that the use will not impact sensitive receivers. This report is to be prepared by a suitably qualified acoustic consultant, and is to consider:
    - The 'NSW Industrial Noise Policy' in terms of assessing the noise impacts associated with development, including all noise generating activities on the site such as the use of the driveway, carpark facilities, traffic, plant and equipment (including PA systems), use of paintball guns, and noise from participants and spectators.
    - The 'Interim Construction Noise Guideline' in assessing the impacts associated with the construction phase of the development.
    - The potential impact from road traffic noise resulting from vehicles entering and exiting site, demonstrating compliance with *NSW Road Noise Policy*.
    - Consider the cumulative impacts of the use of both facilities that are located on the site, such as when the paintball facility is in use when a race meet is being held.
    - Address whether any events will be held on site which may increase the number of people above what would normally attend.
    - Should mitigation measures be necessary, recommendations should be included to this effect.

Use of Paintballs

- The application is required to address the environmental impact of paintballs, including paintball content material.

Environmental Management Plan

- A detailed Environmental Management Plan (EMP) is to be submitted to support the application. The EMP is to address the environmental aspects of the development and is to include details on the environmental management practices and controls to be implemented on the site. The EMP must be prepared by a suitably qualified person and is to address, but is not limited to the following:
    - General procedures for running the facility, including how people will move about the site
    - Water quality management,
    - Soil management,
    - Noise control and hours of operation,
    - Dust suppression,
    - Waste management (including solid and liquid waste),
    - Erosion and sediment control,

- Any development, including structures, within the overland flow area would generally not be supported as it may restrict local overland flow regimes.

- The application must demonstrate that the development proposal is consistent with Council's Development Control Plan for Flood Liable Land.

Traffic Management

- The application shall be supported by a traffic report prepared by a suitably qualified person. The traffic report shall assess the impact of vehicular turning movements to the site from Londonderry Road. The report shall also assess the dual usage of the site with respect to traffic volumes and movements.

- Preliminary investigations by Council indicate for a similar development pavement widening will be required along the eastern side of Londonderry Road as a minimum in order to accommodate a basic right turn / basic left turn (BAR/BAL) treatment. Pending traffic volumes, a higher order turn treatment may be required such as channelised or auxiliary right turn treatment (CHR / AUR).

- The application may be referred to the Roads and Maritime Services.

- The application must demonstrate that access, car parking and manoeuvring details comply with AS2890 Parts 1,2 & 6 and Council's Development Control Plan.

- All vehicular access to the site is to be stabilised.

Roadworks

- The development will require the following external road works:
    - Pavement widening along the eastern side of Londonderry Road

Earthworks

- No retaining walls or filling is permitted for this development which will impede, divert or concentrate stormwater runoff passing through the site.

- Earthworks and retaining walls must comply with Council's Development Control Plan.

- Proposed fill material must comply with Council's Development Control Plan.

APPENDIX A

- SREP 20 – Hawkesbury Nepean
- SEPP 55 - Remediation of Land
- Penrith LEP 2010
- Penrith DCP 2010
- Penrith Draft 'Stormwater Drainage for Building Developments' Policy
- Environmental Planning & Assessment Act, 1979
- Water Management Act 2000
- Nature and extent of any non-compliance with relevant environmental planning instruments, plans and guidelines and justification for any non-compliance.

WASTE MANAGEMENT PLAN for 312 Londonderry Rd, Londonderry

DEMOLITION & CONSTRUCTION PHASE Waste Management Plan Form 2.

Detail of waste management – RECREATION FACILITY (OUTDOOR) – PAINTBALL CENTRE

MATERIALS ON SITE	Est. Vol.	Est. Wt	Reuse and Recycling		Disposal
			ON-SITE	OFF-SITE	
Excavation material					
Concrete & Brickwork	0.5m²				Returned - Readymix
Timber frame demolition & off cuts					
Plasterboard					
Metal off cuts (roofing & trims)					
Other Waste e.g ceramic tiles, paints, plastics, PVC tubing, cardboard	8m³			BK Skip Bin for collection and sorting prior to recycling/disposal	

NB SHED AND ABLUTION BLOCK ARE PURCHASED PREFABRICATED

WASTE MANAGEMENT PLAN for 312 Londonderry Rd, Londonderry

Waste Management Plan Form 3.
Detail of waste management – use of premises phase

MATERIALS	VOLUME (per week)	PROPOSED ON-SITE STORAGE	DESTINATION
Recyclables			
Paper& cardboard Glass bottles & jars Steel cans Aluminum cans Milk & juice cartons Plastic containers (pvc & pet)	50 litres (plastic water bottles, paper toweling, and office paper)	Stored on-site in commercial waste disposal bin for collection by approved contractor.	Recycling
Non-recyclables			
Food scraps, general waste & packaging unsuitable for recycling	NIL expected		

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FLORA AND FAUNA ASSESSMENT REPORT

312 LONDONDERRY ROAD

LONDONDERRY

PREPARED FOR: Tony Wilson

OUR REFERENCE: REP-154213-B

ISSUE DATE: 7th October, 2014

CONTROLLED DOCUMENT

DISTRIBUTION AND REVISION REGISTER

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2 Hard Copy (mailed)	Tony Wilson	Suite 3 L 4 2-12 Foveaux St Surry Hills

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DOCUMENT HISTORY		
Document No.	Revision No.	Issue Date
REP-154214	B	7/10/14

AUTHOR		TECHNICAL REVIEWER
J. Wait		J. Wait
Jessica Wait: Fauna Ecologist	Laurel Fowler: Botanist	Jessica Wait: Fauna Ecologist

Executive Summary

Envirotech Pty Ltd was commissioned by Delta Force Paintball to undertake a flora and fauna assessment at 312 Londonderry Road, Londonderry (Richmond Race Club) NSW. It is understood that the bushland within property is to be subject to the development of a recreational paint ball enterprise. The proposed development involves minimal clearing of remnant vegetation and consists of the establishment of a carpark and administrative building within the cleared section on the site (refer to Appendix 1: Aerial Imagery and Maps).

The purpose of the assessment was to determine whether any threatened flora and fauna species were present at the site, whether it comprised part of an Endangered Ecological Community and whether the flora was likely to provide critical habitat for threatened fauna as listed under the Environmental Protection and Biodiversity Conservation Act 1999 (the EPBC Act) and the Threatened Species Conservation Act 1995 (the TSC Act). The potential for the action to contribute to Key Threatening Processes was also addressed.

A site inspection was conducted on the 17th September, 2014 by Jessica Wait (fauna ecologist) and Laurel Fowler (botanist), from Envirotech Pty Ltd. No threatened fauna species were recorded on site. The threatened ecological communities *Cooks River Castlereagh Ironbark Forest* and *Castlereagh Scribbly Gum Woodland* were recorded onsite however it is not likely that the proposed development will affect the ongoing local survival of these communities. The threatened flora species *Dillwynia tenuifolia* was recorded onsite. If the area containing the plant is managed correctly there should be no risk to the local survival of the species. Furthermore, given that the site has been subjected to illegal dumping of waste, and the establishment of the Paint Ball facility would require this waste to be removed, ecologists at Envirotech hold the opinion that the sites development would have a positive impact on the broader environment and to the health and wellbeing of dependent fauna.

The application of the 7-part test under section 5A of the Environment Planning and Assessment Act 1979 (the EP&A Act), as well as the EPBC Act's 'consideration of impacts on matters of national significance' (Appendix 6), found that there is unlikely to be any significant impact on the threatened flora species or threatened communities recorded onsite. There should also be no significant impact on threatened flora or fauna species with suitable habitat represented onsite.

Our assessment concludes that Species Impact Statements (SIS) and Environmental Impact Statements (EIS) are not required in order for the proposed development to proceed as long as the recommendations (refer to Part 6) are adhered to.

Table of Contents

Table of Tables

Table of Figures

1. Introduction

This report determines the presence of threatened species, habitats, populations (and their associated habitats) as well as ecological communities within the subject property. It is written in accordance with the requirements of the *Environmental Planning and Assessment Act* (1979), *Threatened Species Conservation Act* (1995) and the *Environment Protection and Biodiversity Conservation Act* (1999).

1.1 Aims

The aim of this report is to produce a flora and fauna assessment to:

- Assess the ecological resources of the study site;
- Fulfil the requirements of the section 5a of the *Environmental Planning and Assessment Act* (1979);
- To assess the impact of the development on matters of conservation significance;
- Assess the potential for threatened flora and fauna species and Endangered Ecological Communities (EECs) to occur within the study site which may be listed under commonwealth and state legislation; and
- Suggest measures which may alleviate the disturbance, in alignment with the *Threatened Species Conservation Act*, (1995) and the *Environmental Conservation and Biodiversity Act* (1999).

The specific objectives of the report are to:

- Conduct a database search of the study site;
- Plan and undertake field surveys, designed in accordance with the *Working Draft Threatened Biodiversity Assessment Guidelines for Developments and activities (2004)*;
- Identify habitat for threatened species on the study site that are listed in the schedules of the TSC Act and the EPBC Act that are known or are likely to occur in the study area;
- Undertake an Assessment of Significance in accordance with the TSC Act and significant impact criteria assessments under the EPBC Act for threatened species, communities and populations that can be impacted by the proposal, either directly or indirectly; and
- Provide recommendations to mitigate the impacts of the proposed action.

1.2 Project Context

Table 1: Name and address of client

Client Name	Tony Wilson
Address	312 Londonderry Road, Londonderry NSW
Local government area	Penrith

1.3 Description of Study Area

Table 2: Description of study area

Size of Property	Approximately 39.68 hectares, of which 13.64 ha is to be subject to development.
Current land use	Bushland.
Surrounding land use	Semi-rural land holdings/bushland.
Proposed land use	Paint Ball enterprise.
Map of study site	Provided in Appendix 1.

1.4 Proposed Development

Table 3: Description of proposed development

Carpark	Accommodating for up to 50 cars, to be established within a predominantly cleared and pastured area.
Game Zones	6 game zone areas within the bushland, of varying sizes.
Administration/basecamp building	To be established in a predominantly cleared and pastured area.

The concept plan for the proposed development is provided in Appendix 1.

2. Legislative Requirements and International Agreements

Environment Protection and Biodiversity Conservation Act (1999; Commonwealth legislation)

The EPBC Act is legislation of the Commonwealth. In accordance with this act, all proposed actions are to be assessed to determine impacts on *Matters of National Environmental Significance*. These matters include: World heritage properties; Natural heritage; Wetlands of national importance (RAMSAR, CAMBA, JAMBA and ROKAMBA wetlands); Threatened species and ecological communities; Migratory species; Marine areas in the Commonwealth; and Nuclear actions.

If the proposed action is likely to affect a *Matter of National Environmental Significance*, it is necessary that this action is assessed via the EPBC Acts 'considerations' assessment. If there is likely to be a significant impact on these matters, referral to the Commonwealth Environment Minister is required for review. Approval for the proposed action may then be granted, so long as accompanied control measures alleviate likely impacts.

Threatened Species Conservation Act, 1995 (New South Wales)

The central aim of the *Threatened Species Conservation Act* is to protect any threatened flora and fauna occurring in NSW, omitting marine plants and fish. The Act provides information for the identification, conservation and recovery of threatened species as well as their associated populations and communities, and any threats that are imposed on those species. If a proposed action is likely to have an effect on a threatened species, population or ecological community, then this is considered in the development approval process. If the impact is considered significant then a Species Impact Statement (SIS) must be prepared and submitted to the Director General and further agreement and approval is needed. In certain circumstances, the Minister for the Environment may additionally be consulted.

Environmental Planning and Assessment Act 1979 (NSW)

The primary objective of the *Environmental Planning and Assessment Act* (1979), is focused on the protection of the environment. This includes the protection of native flora and fauna, threatened species, populations, ecological communities and their associated habitats. The secondary objective of this act is to implement the precautionary principle, outlined in the *Protection of the Environment Administration Act* (1991). Under section 5A of the Act and Section 94 of the *Threatened Species Conservation Act* (1995), seven listed factors collectively termed the '7-part assessment of significance', allows the determination of the likely impact of a proposed action on threatened species, population or endangered ecological communities. If the proposed action is assessed as likely to have an effect on any of these, then a SIS is required.

International migratory animal agreements include:

a. Appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals) for which Australia is a Range State under the Convention;
b. The recognised agreement between Australia and the People's Republic of China for the Protection of Migratory Birds in Danger of Extinction and their Environment (CAMBA);
c. The recognised agreement between Australia and the Republic of Korea on the Protection of Migratory Birds (ROKAMBA); and,
d. The recognised agreement between Australia and Japan for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment (JAMBA).

3. Methodology

3.1 Literature and Database Search

A database review was conducted prior to undertaking onsite surveys. This was done to give Envirotech ecologists an insight into which threatened or migratory species should be targeted during field surveys. Table 4 provides an overview of the desktop review.

Table 4: Overview of Desktop Search

Search Tool	**Description**	**Search Parameters**
The NSW Bionet *Atlas of New South Wales Wildlife*	Used to generate a list of species listed under the TSC Act.	Parameters set to a 10km radius of the study site.
Commonwealth *Protected Matters Search Tool*	Used to generate a list of species protected under the EPBC Act	Parameters set to a 10km radius of the study site.
Vegetation Information System (OEH)	Used to generate a map of the vegetation community onsite	CumberlandPlain_GT10pc_E_2221
Species Profile and Threats database search	Used to assess threatened and migratory species distribution, ecology and Key Threatening Processes	N/A

3.2 Terrestrial Flora Survey

Botanist Laurel Fowler conducted the flora survey at 10:30 am on Wednesday 17th September for approximately three hours. It was a warm and sunny spring day.

The methodology employed was designed in accordance with the *Working Draft Threatened Biodiversity Assessment Guidelines for Developments and activities (2004)*. Table 5 refers to specific techniques employed.

A comprehensive species list was recorded at the time of the survey (refer to Appendix 2: Species recorded on site). Targeted surveys of recorded or potential ROTAPs as indicated by the preliminary assessment was undertaken. Table 5: Survey techniques employed to target threatened flora

Survey Type	Description	Is this in accordance with Guidelines?
Random Meander	The entire site was assessed and all species identified were recorded.	Yes

3.2.1 Habitat Assessment

The degree to which the vegetation on the site resembled natural, undisturbed vegetation was used to determine the habitat potential of the site. This included the following criteria:

- The composition of the species (diversity, degree of weed invasion); and
- Structure of the vegetation (how many original layers of vegetation existed).

Criteria used to evaluate the habitat values of the area in general terms, were *good, moderate, poor* and *cleared/disturbed*. These are detailed below in Table 6.

Table 6: Criteria used to assess habitat quality for threatened flora

Score	Criteria
Good	There is a high diversity of species, no weeds are extant or those weeds that are present only occur on the edges of the study site, the vegetation represents many layers (i.e. ground, shrub, canopy layers) and these are readily identifiable
Moderate	There are a high number of native species, some weed invasion but these only occur in small patches, one or more of the vegetation layers are disturbed but these are relatively intact;
Poor	There is a low number of native species, many of the plants that are on the site consist of exotic species that occur in dense patches, more than one of the vegetation layers has been disturbed or removed;
Cleared and disturbed	this represents a significantly modified landscape that has less than three native species, invasive species are mostly dominant, there is little representation of vegetation layers, the soil profile is disturbed and there is the likelihood that the area will regenerate to its natural condition and that revegetation techniques would need to be implemented in order to achieve this.

3.3 Terrestrial Fauna Survey

A terrestrial fauna survey was undertaken by Jessica Wait, on the 17th of September, 2014. It was limited to a 3 hour diurnal survey session, between the hours of 10:30am – 1:30pm. An additional diurnal fauna survey was undertaken earlier in the year for a separate proposal on the same site by Envirotech Pty Ltd and when considered together, both surveys cater for some degree of seasonal variation between fauna species composition.

Methodology employed was in accordance with the *Working Draft Threatened Biodiversity Assessment Guidelines for Developments and activities (2004)* and consisted of the following (Table 7).

Table 7: Survey techniques employed to target threatened fauna

Survey Type	**Description**	**Does this match guidelines?**
Reptile Search	A reptile search was conducted for 1.5 hours, by one person, across the entire study area. Techniques included peeling back bark from trees, overturning logs and searching under discarded building rubble. The reptile survey was also supplemented with an additional reptile search conducted onsite during February, 2014 (Envirotech Pty Ltd, Per-113314A).	Yes.
Frog Search	A frog search was undertaken for approximately 1 hour by one person. It was undertaken along the entire perimeter of the lake, and along the creek banks and drainage channel within the site. Techniques included listening and identifying calls, as well as overturning logs and disused rubber tyres which were filled with water and mud. This search was supplemented by an additional frog survey conducted during February 2014 (Envirotech Pty Ltd, Per-113314A).	Yes, however no trapping, spotlighting or call playback techniques were utilised.

Survey Type	Description	Does this match guidelines?
Bird Point Count Surveys	One diurnal point count survey was undertaken for approximately 20 minutes by one person, overlooking the lake.	Yes, however only one survey was allocated. No spotlighting or call playback techniques were utilised to identify nocturnal species.
Opportunistic	For 3 hours total, opportunistic sightings of all fauna species were recorded. Opportunistic surveys were also supplemented with an additional fauna survey conducted onsite during February, 2014 (Envirotech Pty Ltd, Per-113314A).	Yes
Tracks/scats/traces	The sandy area surrounding the lake provided an excellent opportunity to identify animal tracks. Scats were also collected along with animal skulls to identify. Surveys were also supplemented with an additional fauna survey conducted onsite during February, 2014 (Envirotech Pty Ltd, Per-113314A).	Yes

3.3.1 Habitat Assessment

A number of habitat values were recorded during the site inspection (Table 8).

The potential for the site to provide habitat for threatened fauna species was based upon these habitat values, and the specific habitat requirements of threatened species. Criteria used to evaluate the overall quality of the habitat, were good, moderate, and poor. This criteria is detailed in Table 9.

Table 8: Description of fauna habitat values

Habitat Value	Description
Hollow Bearing Trees	All hollow bearing trees were examined for fauna occupancy, by identifying scratches surrounding hollows and along the tree trunk. All hollows had their exact location recorded in a Garmin GPS for later overlay on GIS maps.
Stags	Due to the potential habitat value of stags (they often hollow out over time of provide hollows for fauna), their exact location was recorded within a GPS Garmin for later overlay on GIS maps.
Connectivity	The connectivity of the site was determined by examining aerial photography.
Water	All surface waters were examined onsite for quality and surface water type, i.e. whether they were still, flowing, ephemeral or stagnant.
Rocky Outcrops	Any rocky outcrops or bushrock are usually inspected for fauna and recorded into the GPS. In this instance, no bush rock was identified on the site, only builders' rubble/concrete. It was examined for fauna none the less.
Leaf Litter	The quality and quantity of leaf litter was noted during the field survey.

Table 9: Criteria used to assess habitat quality for threatened fauna

Score	Criteria
Good	The presence of the ground flora consists of a diverse range of native species, the assemblages of species of the vegetation, leaf litter, significant number of refuge, feeding and breeding sites and the presence of a diverse range of native fauna species
Moderate	The ground flora contains a relatively high number of native species, the assemblages of species is relatively undisturbed, leaf litter, the presence of some refuge, feeding and breeding sites and diverse presence of native fauna
Poor	There was a low diversity of ground flora and very little presence of native flora, the assemblages of species of vegetation is low, poor presence of leaf litter, little or no refuge, feeding and breeding sites and a low diversity of fauna species.

3.4 Key Threatening Processes

A list of Key Threatening Processes listed under the *Environmental Protection and Biodiversity Conservation Act* (1999) and *Threatened Species Act* (1995) was generated by conducting a desktop search of the *Species Profile and Threats* database. During the site inspection, the presence or absence of these processes occurring on the site were documented, with additional threats not otherwise being listed, considered.

3.5 Limitations of the Report

The methodological design employed for the purposes of this report was habitat based, and in accordance with Section 5A of the *Environment Planning and Assessment Act* (1979). No trapping, spotlighting, call playback techniques were utilised.

In respect to the timing of the survey and the survey effort employed, a considerable continuum of fauna and flora species and assessments of the ecological processes that are likely to be imposed on the study site, have been derived through desktop searches, and background and literature searches. Therefore, a full inventory of flora and fauna and the ecological processes likely to occur on the study site and surroundings cannot be fully provided in this report.

It is also acknowledged that the presence and detection of threatened and migratory species can alter in respect to time, which includes seasonal weather and climatic cycles. These limitations have been mitigated by identifying any potential habitat for flora and fauna species and by

assessing the likelihood of occurrence of these species, with respect to previous records, the habitat present, the land use on the study site and the landscape context of the wider area.

The report has collected data from publically available data sources and is bound by the limitations of the collection, processing and management of those databases used.

4. Results

4.1 Vegetation Communities

Results of the Desktop research is provided in Table 10, with vegetation community maps provided in Figure 3 of Appendix 1.

The field investigation identified two distinct vegetation communities onsite and within the immediate surrounding area. These are:

1. *Castlereagh Scribbly Gum Woodland* (Vulnerable).
2. *Cooks River Castlereagh Ironbark Forest* (Endangered)

Both of these communities present on the site are listed under the TSC Act.

Figure 1: Photograph displaying the Castlereagh Scribbly Gum Woodland

Table 10: Results of Bionet and Protected Matters Search tool, identifying threatened ecological communities recorded onsite

Community name	**NSW Status**	**Commonwealth status**	**Occurrence**
Agnes Banks Woodland in the Sydney Basin Bioregion	Endangered Ecological Community	Critically Endangered	Not detected
Blue Gum High Forest in the Sydney Basin Bioregion	Critically Endangered Ecological Community	Critically Endangered	Not detected
Blue Mountains Shale Cap Forest in the Sydney Basin Bioregion	Endangered Ecological Community	Critically Endangered	Not detected
Blue Mountains Swamps in the Sydney Basin Bioregion	Vulnerable	Endangered	Not detected
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	Vulnerable	Not listed	Detected on the site
Castlereagh Swamp Woodland Community	Endangered Ecological Community	Not listed	Not detected

Community name	NSW Status	Commonwealth status	Occurrence
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	Endangered Ecological Community	Not Listed	Detected on the site
Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered Ecological Community	Critically Endangered	Not detected
Freshwater wetland on coastal floodplains of the New South Wales North Coast, Sydney Basin and South East corner bioregions	Endangered Ecological Community	Not listed	Not detected
Montane peatlands and swamps of the New England Tableland, NSW North Coast, Sydney Basin, South Easter Corner, South Eastern Highlands and Australian Alps bioregions	Endangered Ecological Community	Endangered	Not detected
Newnes Plateau Shrub Swamp in the Sydney Basin Bioregion	Endangered Ecological Community	Endangered	Not detected
River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales, North Coast, Sydney Basin and South East Corner Bioregions	Endangered Ecological Community	Not listed	Not detected
Shale gravel Transition Forest in the Sydney Basin Bioregion	Endangered Ecological Community	Critically Endangered	Not detected

Species	NSW Status	Commonwealth status	Occurrence on the study site
Shale/Sandstone Transition Forest	Endangered Ecological Community	Endangered	Not detected
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion	Endangered Ecological Community	Not listed	Not detected
Sun Valley Cabbage Gum Forest in the Sydney Basin Bioregion	Critically Endangered Ecological Community	Not listed	Not detected
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Endangered Ecological Community	Not listed	Not detected
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	Endangered Ecological Community	Critically Endangered	Not detected
White Box Yellow Box Blakely's Red Gum Woodland	Endangered Ecological Community	Critically Endangered	Not detected

4.2 Flora

4.2.1 Desktop Research

Results of the desktop research is provided in Table 11. A total of 24 threatened flora species have been recorded within a 10km radius of the study site. This includes:

- 13 species listed under the TSC Act
- 11 species listed under the EPBC Act

4.2.2 Flora Surveys

Flora surveys revealed the following:

Table 11: Habitat features present onsite for threatened flora

Feature	Quantity	Description
Species diversity	High	Many native and exotic plants were present at all vegetation strata.
Structural integrity	Yes	All strata were heavily vegetated with native and exotic species.
Habitat quality	Moderate	Some areas were largely native, however others had many exotic species and some areas have been prone to illegal dumping of rubbish.
Disturbances	High	Illegal dumping of rubbish and high weed invasion have disturbed the site.

4.2.3 Assessment of Occurrence

In collating results from desktop and field surveys, it has been determined that there is:

- A low likelihood of the occurrence of 3 species to be present onsite
- A moderate likelihood of occurrence of 1 species to be present onsite
- A high likelihood of occurrence of 9 species to be present onsite.

Species with a moderate – high likelihood of occurrence are:

- *Acacia bynoeana*
- *Acacia pubescens*
- *Allocasuarina glareicola*
- *Dillwynia tenuifolia*
- *Grevillea juniperina* subsp. *juniperina*
- *Micromyrtus minutiflora*
- *Persoonia hirsuta*
- *Pimelea curviflora* var. *curviflora*
- *Pultenaea parviflora*

For these species, 7 Part Tests of Significance have been prepared, and are present in Appendix 4.

Dillwynia tenuifolia was recorded on site and is listed as vulnerable under the Threatened Species Conservation Act 1995. An assessment of significance found the impact to be not significant (refer to Appendix 4 – Assessment of Significance), provided the recommendations detailed are undertaken.

An assessment of available habitat resources onsite, specific to threatened flora species is provided in Table 12.

Table 12: An analysis of threatened flora species likely to occur onsite

Species	Common name	NSW status	Commonwealth status	Habitat	Occurrence on the study site
Acacia bynoeana	Bynoe's Wattle	E	E	Occurs in heath or dry sclerophyll forest on sandy soils. Prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	Likely
Acacia pubescens	Downy Wattle	V	V	Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravely soils, often with ironstone.	Likely
Allocasuarina glareicola		E	E	Grows in Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis*, *Eucalyptus fibrosa*, *Angophora bakeri*, *Eucalyptus sclerophylla* and *Melaleuca decora*. Common associated understorey species include *Melaleuca nodosa*, *Hakea dactyloides*, *Hakea sericea*, *Dillwynia tenuifolia*, *Micromyrtus minutiflora*, *Acacia elongata*, *Acacia brownei*, *Themeda australis* and *Xanthorrhoea minor*.	Likely
Dillwynia tenuifolia		V	NL	In western Sydney, may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. At Yengo, is reported to occur in disturbed escarpment woodland on Narrabeen sandstone.	Likely
Eucalyptus benthamii	Camden White Gum	V	V	Requires a combination of deep alluvial sands and a flooding regime that permits seedling establishment. Recruitment of juveniles appears to be most successful on bare silt deposits in rivers and streams.	Not Likely

Species	Common name	NSW status	Commonwealth status	Habitat	Occurrence on the study site
Grevillea juniperina subsp. *juniperina*		V	NL	Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels.	Likely
Leucopogon exolasius	Woronora Bearded Heath	V	V	The plant occurs in woodland on sandstone.	Likely
Micromyrtus minutiflora		E	V	Grows in Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open Forest on tertiary alluvium and consolidated river sediments.	Likely
Persoonia hirsuta	Hairy Geebung	E	E	The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. It is usually present as isolated individuals or very small populations.	Likely
Persoonia nutans	Nodding Geebung	E	E	Restricted to the Cumberland Plain and generally confined to Aeolian and alluvial sediments and occur in a range of communities including Cooks River/Castlereagh Ironbark Forest.	Not Likely
Pimelea spicata	Spiked Rice Flower	E	E	In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils. On the Cumberland Plain sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark.	Not Likely
Pimelea curviflora var. *curviflora*		V	V	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowland Grassy Woodland habitat at Albion Park on the Illawara coastal plain.	Possible

Species	Common name	NSW status	Commonwealth status	Habitat	Occurrence on the study site
Pultenaea parviflora		E	V	May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	Likely

4.3 Terrestrial Fauna

4.3.1 Desktop Research

Results of the desktop research is provided in Table 4. A total of 38 threatened fauna species have been recorded within a 10km radius of the study site. This includes:

- 37 species listed under the *Threatened Species Conservation Act* (1995), and;
- 17 species listed under the *Environmental Protection and Biodiversity Conservation Act* (1999).

4.3.2 Fauna Surveys

A list of the species recorded onsite during both survey periods are present in Appendix 2. In total, 29 species were recorded on site.

None of these species are listed as threatened or migratory under the EPBC Act of the TSC Act.

4.3.3 Habitat Assessment

An overview of the habitat assessment is provided in the Table 13 below. A more detailed description of the habitat onsite is provided in Appendix 4.

Table 13: Habitat features onsite for threatened fauna

Habitat Value	Quantity	Description
Hollow Bearing Trees	Low	A low level of hollows here noted due to the high prevalence of leptospermum trees.
Stags	Low	A low amount of stags were recorded within the site.
Connectivity	Moderate	The study site exists in a largely cleared and fragmented landscape. The greyhound racetrack is to the immediate north, and what appears to be a sand quarry exists to the immediate south west of the study site.

Habitat Value	Quantity	Description
Water	High	The quantity of water was high, due to the permanent lake noted onsite, and the semi-permanent creek bed. Tadpoles were present along with a freshwater yabbies.
Rocky Outcrops	Low	No rocky outcrops or bushrock was observed during the fauna survey. There were however, large blocks of concrete and builders waste.
Leaf Litter	Moderate	Leaf litter was considered high within the well vegetated areas. Much of the site however has been cleared of overlying vegetation and within those areas leaf litter and accumulation was considered low.

4.3.4 Assessment of Occurrence:

In collating results from desktop and field surveys, it has been determined that there is:

- A low likelihood of the occurrence of 18 species to be present on the study site;
- A moderate likelihood of occurrence of 20 species to be present on the study site; and,
- No likelihood of a high occurrence of any species to be present on the study site.

Species with a moderate – high likelihood of occurrence are:

- *Heleioporus australiacus* Giant Burrowing Frog
- *Litoria aurea* Green and Golden Bell Frog
- *Ephippiorhynchus asiaticus* Black necked stork
- *Botarus poiciloptilus* Australasian Bittern
- *Circus assimilis* Spotted Harrier
- *Lophoictinia isura* Square tailed Kite
- *Hieraaetus morphnoides* Little Eagle
- *Calyptorhynchus lathami* Glossy black cockatoo
- *Glossopsitta pusilla* Little lorikeet
- *Lathamus discolour* Swift Parrot
- *Ninox connivens* Barking Owl
- *Tyto novaehollandiae* Masked owl
- *Chthonicola sagittata* Speckled Warbler
- *Anthochaera phrygia* Regent Honeyeater
- *Melithreptus gularis gularis* Black chinned honeyeater

- *Daphoenositta chrysoptera* Varied sitella
- *Petroica phoenicea* Flame Robin
- *Phascolarctos cinereus* Koala
- *Potorous tridactylus* Long nosed potoroo
- *Pteropus poliocephalus* Grey- headed Flying Fox

For a number of these species, 7 Part Tests of Significance have been prepared, and are present in Appendix 4.

Table 14: An analysis of threatened fauna species likely to occur onsite

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurence
			Herpetofauna		
Heleioporus australiacus	Giant Burrowing Frog	Vulnerable	Vulnerable	This species occurs in woodland and open dry sclerophyll forest, and commonly burrows below the soil surface. When they breed they will be found in chorus along creek lines, under vegetation and rocks. Breeding habitat consists of pools near second order streams.	Moderate
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable	This species occurs in open forests in wet drainage lines that occur below sandstone ridges. It seeks refuge in leaf litter or dense vegetation.	Moderate
Litoria littlejohni	Little John's Tree Frog	Vulnerable	Vulnerable	Inhabits heath based forests and woodlands where it shelters under leaf litter and low vegetation. Breeds in the upper reaches of permanent streams and perched swamps.	Low
Mixophyes balbus	Stuttering Frog	Endangered	Vulnerable	Occurs in rainforest and wet, tall open forest in the foothills and escarpment on the Eastern side of the Great Dividing Range.	Low
Hoplocephalus bungaroides	Broad Headed Snake	Endangered	Vulnerable	This species take shelter in rock crevices and is found commonly on exposed cliff edges. It will also shelter in hollow logs embedded in escarpments. Will feed on small reptiles and amphibians.	Low
			Aves		
Ephippiorhynchus asiaticus	Black necked stork	Endangered	Not listed	Will be found to inhabit shallow, permanent freshwater terrestrial wetlands that have surrounding vegetation. These include farm dams, swamps, floodplains and billabongs. They forage in open shallow still water of open wetlands where they eat fish, macroinvertebrates, eels and frogs. This species will nest in an isolated paddock tree which may be dead or alive or even in the understory.	Moderate
Botarus poiciloptilus	Australasian Bittern	Endangered	Endangered	Prefers permanent, freshwater wetlands with tall, dense vegetation.	Moderate

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurence
Circus assimilis	Spotted Harrier	Vulnerable	Not listed	This species occurs in open woodland which include mallee remnants. It is found predominately in native grassland but can be found foraging over agricultural land and other open habitats such as around wetlands.	Moderate
Lophoictinia isura	Square tailed Kite	Vulnerable	Not listed	This species inhabits a range of timbered habitats such as open forest and dry woodlands. It is found commonly around timbered watercourses.	Moderate
Hieraaetus morphnoides	Little Eagle	Vulnerable	Not listed	Found in eucalypt forests, woods and She oak woodlands and riparian woodlands of the interior of NSW. Will nest in tall living trees.	Moderate
Falco subniger	Black Falcon	Vulnerable	Not listed	This species occurs mostly in inland regions.	Low
Calyptorhynchus lathami	Glossy black cockatoo	Vulnerable	Not listed	Occurs in open forest and woodland mostly on the coast. It prefers vegetation of Sheoak and Forest Sheoak (*Allocasuarina ssp.*) on which it feeds.	Moderate
Glossopsitta pusilla	Little lorikeet	Vulnerable	Not listed	Found where it will feed on the canopy species in Eucalyptus forest and woodland.	Moderate
Lathamus discolor	Swift Parrot	Endangered	Endangered	Found where eucalypts are flowering profusely or where lerp infestations are evident. Will return to feed areas where there is foraging resources. Favoured species include Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens* in the winter. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*.	Moderate
Polytelis swainsonii	Superb Parrot	Vulnerable	Vulnerable	Found in Box-Gum, Cypress pine and Boree woodlands and River Red Gum forest. Nests in tree hollows.	Low

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurence
Ninox connivens	Barking Owl	Vulnerable	Not listed	Occurs in a range of habitats including woodland and farmland. Will also occur in fragmented remnants. Will roost in midstory or canopy vegetation Will hunt small arboreal mammals	Moderate
Tyto novaehollandiae	Masked owl	Vulnerable	Not listed	Occurs mostly in dry Eucalypt forests and woodland. Has a large home range.	Moderate
Chthonicola sagittata	Speckled Warbler	Vulnerable	Not listed	Will occur in a range of Eucalyptus dominated communities with a grassy understory. Will often be found around rocky ridges and gullies. Their typical habitat consists of native grasses, a sparse shrub under layer and some eucalypts that still retain an open canopy. This species requires a relatively large habitat area (approx. 10 hectares to breed and a larger area to forage) that is undisturbed for it to persist.	Moderate
Anthochaera phrygia	Regent Honeyeater	Crticially Endangered	Endangered	The Regent Honeyeater inhabits woodlands and if conserved will benefit a range of other species. This species will inhabit dry open forest and woodland, in particular Ironbark woodland and riparian forests of River Sheoak. This species occurs in conjunction with a range of other species and where there are large numbers of mature trees and an abundance of mistletoe. It is a generalist forager and will forage on a range of eucalypts and mistletoes. Key species include: *Eucalyptus microcarpa, E. punctata, E. polyanthemos, E. moluccana, Corymbia robusta, E. crebra, E. caleyi, C. maculata, E.mckieana, E. macrorhyncha, E. laevopinea*, and *Angophora floribunda*. Nectar and fruit from the mistletoes *Amyema miquelii, A. pendula* and *A. cambagei* are also eaten during the breeding season. They will also utilize the understory to hunt for invertebrates.	Moderate
Grantiella picta	Painted Honeyeater	Vulnerable	Not listed	This species occurs in Boree, Brigalow and Box Gum Woodlands and Box Ironbark Forests. It is a specialist feeder of the fruits of mistletoes.	Low
Melithreptus gularis gularis	Black chinned honeyeater	Vulnerable	Not listed	Occurs in the canopy of open forests where *E. sideroxylon, E. albens, E. macrocarpa, E. mellidora, E. blakelyi* and *E. tereticornis* are found. Occurs where stringybarks are found.	Moderate

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurence
Daphoenositta chrysoptera	Varied sitella	Vulnerable	Not listed	This species occurs in Eucalypt forests particularly where rough barked species are found.	Moderate
Petroica phoenicea	Flame Robin	Vulnerable	Not listed	This species will occur in tall moist eucalypt forests and woodlands where ridges and slopes are present. It will be found where there are clearings on areas with an open understory.	Moderate
			Mammalia		
Dasyurus maculatus	Spotted tailed quoll	Vulnerable	Endangered	This species occurs in a range of habitat types which encompass woodland, rainforest, open forest and heath. This species requires fallen logs, caves, rock crevices and rocky cliff faces for refuge.	Low
Phascolarctos cinereus	Koala	Vulnerable	Vulnerable	This species occurs in Eucalypt woodlands and forests. Require a home range of 2 hectares up to several hundred hectares.	Moderate
Petaurus norfolkensis	Squirrel Glider	Vulnerable	Not listed	This species is found where there is old grown Box or Box Ironbark woodland and River Red Gum forest. It will occur in habitats that have a mixed assemblage and will live in family groups of a single male and several females and offspring. They require abundant tree hollows for nesting and refuge.	Low
Potorous tridactylus	Long nosed potoroo	Vulnerable	Vulnerable	This species is found in coastal heaths and dry and wet sclerophyll forests. It requires a dense understory with occasional open areas. It is found in vegetation with a diverse assemblage made up of grasses, trees, sedges, ferns and heaths and low shrubs of tea tree and melaleucas. They prefer a sandy loam soil.	Moderate

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurence
Pseudomys novaehollandiae	New Holland Mouse	Not listed	Vulnerable	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes	Low
Petrogale penicillata	Brush tailed rock wallaby	Endangered	Vulnerable	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north	Low
Petaurus australis	Yellow bellied glider	Vulnerable	Not listed	This species occurs in mature or old growth Ironbark Woodlands as well as River Red Gum Forest. It occurs in places where an *Acacia* midstory is present. They require abundant tree hollows for nesting and refuge	Low
Mormopterus norfolkensis	Eastern freetail bat	Vulnerable	Not listed	This species occurs in sclerophyll forests, woodlands and mangrove regions. It finds refuge in tree hollows but will also roost under other structures.	Low
Chalinolobus dwyeri	Large eared pied bat	Vulnerable	Vulnerable	This species roosts in caves, cliffs, abandoned mines and in Fairy Martin *Petrochelidon ariel* nests. Found in well vegetated areas where there are gullies.	Low
Scoteanax rueppelli	Greater broad nosed bat	Vulnerable	Not listed	This species occurs in a wide range of habitats. It is mostly found in tall wet forest. Forages along creek and river edges.	Low
Pteropus poliocephalus	Grey- headed Flying Fox	Vulnerable	Vulnerable	Inhabits rainforests, woodlands and swamps. Occasionally found in urban areas.	Moderate
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not listed	Found in moist habitats where there is an abundance of trees taller than 20 metres	Low
Myotis macropus	Southern Myotis	Vulnerable	Not listed	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage	Low
Meridolum corneovirens	Cumerland Plain Land Snail	Endangered	Not listed	Found predominantly in the Cumberland Plain woodland. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.	Low

4.4 Migratory Species

4.4.1 Desktop Research

Results of the desktop research is provided in Table 15. A total of 14 migratory species have been recorded within a 10km radius of the study site.

4.4.2 Fauna Surveys

No migratory species were identified during the fauna assessments.

4.4.3 Assessment of Occurrence

In collating results from desktop and field surveys, it has been determined that there is a:

- low likelihood of the occurrence of 7 migratory species to be present on the study site
- moderate likelihood of occurrence of 5 species to be present on the study site
- high likelihood of occurrence of 2 species to be present on the study site.

Those species with a moderate or high occurrence are:

- *Hirundapus caudacutus* White- throated Needletail
- *Ardea alba* Great Egret
- *Haliaeetus leucogaster* White- bellied Sea- Eagle
- *Gallinago hardwickii* Latham's Snipe
- *Merops ornatus* Rainbow Bee-eater
- *Rhostratula benghalensis* Painted Snipe
- *Actitis hypoleucos* Common sandpiper

These species listed are assessed under the *Environmental Protection and Biodiversity Act* (1999) '*Considerations*' (Appendix 5).

Table 15: Results of the Desktop research, showing the occurrence of migratory species within a 10km radius of the site (C=CAMBA; J=JAMBA, K=ROKAMBA)

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurrence on Study Site
Hirundapus caudacutus	White-throated Needletail		C,J,K	This species is almost exclusively aerial, thus conventional habitat descriptors are inapplicable. They occur over a wide range of habitats but prefer those with trees such as wooded areas (e.g. open forest and rainforest) but will be seen flying over farmland and mudflats.	Moderate
Apus pacificus	Fork- tailed Swift		C,J,K	This species is almost exclusively aerial, usually occurring over inland plains. They are also seen flying over urban and settled areas. They usually occur over dry, open habitats such as grasslands.	Low
Ardea ibis	Cattle Egret		C,J	Found in tropical and temperate grasslands, wooded areas and around terrestrial wetlands that have low emergent vegetation. Congregate in pastures that are low lying and poorly drained and occur commonly with livestock. Their most preferred habitat is wetlands that are shallow, open and fresh with low lying emergent vegetation.	Low
Ardea alba	Great Egret		C, J	Occupies a wide range of wetland habitats including swamps and marshes, margins of rivers and lakes, damp or flooded grasslands and salt marshes.	High
Haliaeetus leucogaster	White-bellied Sea-Eagle		C	Predominantly in coastal habitats but also recorded around terrestrial wetlands in tropical and temperate areas. They require large open areas of water for foraging but will be found flying over terrestrial habitats in which they occasionally forage. They will be found around swamps, lakes and sewage ponds. They occur in coastal dunes, tidal flats, grassland, heathland, woodland, forest and even urban areas	Moderate
Gallinago hardwickii	Latham's Snipe		C,J,K	Occur in a range of habitats from permanent and ephemeral wetlands that have low emergent vegetation, to modified or artificial habitats that are close to human influences. They will occur in a range of water bodies such as waterholes, bogs, lakes, lagoons and creeks and in a range of vegetation types and communities	High

Species	Common Name	NSW Status	Commonwealth Status	Habitat	Occurrence on Study Site
Merops ornatus	Rainbow Bee-eater		J	Occurs mainly in open forests and woodlands, shrub lands and in various cleared and semi- cleared areas including farmland.	Moderate
Monarcha melanopsis	Black- faced Monarch		Bonn	Occurs in rainforest ecosystems, vine forest and tropical rainforest.	Low
Symposiarchus trivirgatus	Spectacled monarch		Bonn	This species occurs in rainforests and wet gullies	Low
Myiagra cyanoleuca	Satin Flycatcher		Bonn	Inhabit heavily vegetated gullies in Eucalypt- dominated forests and taller woodlands. On migration occur in coastal forests, woodlands and mangroves.	Low
Rhipidura ruffifrons	Rufous Fantail		Bonn	Usually inhabits wet sclerophyll forest, often in gullies with a dense shrubby understorey, often including ferns.	Low
Rhostratula benghalensis	Painted Snipe	Endangered	C, Endangered	Inhabits shallow, terrestrial, freshwater wetlands, including temporary and permanent lakes, swamps and clay pans.	Moderate
Actitis hypoleucos	Common sandpiper		C,J,K	This species is found in a range of wetland habitats that vary in salinity. They are found on rocky shores and muddy margins. It will also occur in lakes pools, billabongs, farm dams and claypans.	Moderate
Tringa stagnatilis	Marsh Sandpiper		C,J,K	Lives in permanent or ephemeral wetlands of varying salinity including swamps, lagoons, billabongs, saltmarshes, estuaries and sewage farms.	Low

4.5 Key Threatening Processes

Key threatening processes (KTP) listed under the *Environmental Protection and Biodiversity Conservation Act* (1999) and *Threatened Species Act* (1995) relevant to the site have been listed in Table 16.

Where the proposal is shown to contribute to KTP, these are further considered in section 5, and Appendix 4.

Table 16: Key threatening processes relating to the development

Threatening Process	Act	Likely to Occur on site at present	Proposal may contribute
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	TSC	Potentially	No
Bushrock removal	TSC	No	No
Clearing of native vegetation	TSC/EPBC	Potentially	Yes
Competition and grazing by the feral European rabbit	TSC	Potentially	No
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	TSC/EPBC	No	No
Invasion of native plant communities by exotic perennial grasses	TSC	Yes	No
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	TSC/EPBC	Yes	No
Predation by the European fox	TSC	Yes	No
Removal of dead wood and dead trees	TSC	Yes	Yes

5. Impacts of the Proposed Development

5.1 Potential Impacts on Endangered Ecological Communities (EECs)

The proposal is likely to cause the following impacts on the ecological community *Castlereagh Scribbly Gum Woodland* and *Cooks River Castlereagh Ironbark Forest,* present on site:

- Loss of leaf litter and decorticating bark;
- Trampling of native vegetation during the construction phase; and
- Altered drainage patterns due to the loss of vegetation and the potential increase of impervious surfaces.

However, an assessment of Significance has determined that the development will **NOT** have a significant impact upon the two endangered Ecological Communities present onsite (Appendix 4). An assessment of considerations under the *Environmental Protection and Biodiversity Conservation Act* (1999) has also determined that it is unlikely that this development will lead to the local extinction of the two communities.

5.2 Potential Impacts on Threatened Flora Species

The proposal is likely to cause the following impacts on threatened flora species:

- Removal of habitat
- Functional and structural changes within flora populations
- Loss of flora biodiversity in the region.
- Loss of habitat due to the invasion of weeds

Table 17 provides a justification for the conduct of a Seven Part Test, in relation to individual flora species.

This assessment has determined that the development will **NOT** have a significant impact upon the two threatened ecological communities present onsite (Appendix 4). An assessment of considerations under the *Environmental Protection and Biodiversity Conservation Act* (1999) has also determined that it is unlikely that this development will lead to the local extinction of the two communities.

Table 17: The potential impact on threatened flora species that have habitat represented onsite, and whether a Seven Part Test (TSC Act has been applied)

Scientific Name	TSC Act	EPBC Act	Individual death or injury	Loss or disturbance	Loss or disturbance to reproduction	Impact assessment applied?
Acacia bynoeana	E	V	Potentially	Potentially	Potentially	Yes
Acacia pubescens	V	V	Potentially	Potentially	Potentially	Yes
Allocasuarina glareicola	E	E	Potentially	Potentially	Potentially	Yes
Dillwynia tenuifolia	V	NL	Potentially	Potentially	Potentially	Yes
Grevillea juniperina subsp. *juniperina*	V	NL	Potentially	Potentially	Potentially	Yes
Leucopogon exolasius	V	V	Potentially	Potentially	Potentially	Yes
Micromyrtus minutiflora	E	V	Potentially	Potentially	Potentially	Yes
Persoonia hirsuta	E	E	Potentially	Potentially	Potentially	Yes
Pimelea curviflora var. *curviflora*	V	V	Potentially	Potentially	Potentially	Yes
Pultenaea parviflora	E	V	Potentially	Potentially	Potentially	Yes

5.3 Potential Impacts on Threatened Fauna Species

The proposal is likely to cause the following impacts on threatened flora species:

- Injury of individuals
- Reduction and loss of breeding resources
- Reduction and loss of foraging resources
- Disturbance to a larger habitat area

This is mainly a result of disturbance to habitats from people trampling vegetation and increased noise making the site less 'desirable' to breed and forage within.

Table 18 outlines the impacts that the proposal may have on these species and determines whether a Seven Part Test (TSC Act) is required.

Seven Part tests have been prepared for the following species:

- Giant burrowing frog *Heleioporus australiacus*
- Green and golden bell frog *Litoria aurea*
- Black chinned honeyeater *Mellthreptus gulgaris*
- Varied sittella *Daphoenositta chrysoptera*
- Flame Robin *Petroica phoenicea*

This assessment has determined that the development will **NOT** have a significant impact upon any of these threatened species. An assessment of considerations under the *Environmental Protection and Biodiversity Conservation Act* (1999) has also determined that it is unlikely that this development will lead to the local extinction of these species.

Table 18: The potential impact on threatened fauna species, and whether a Seven Part Test (TSC Act has been applied

Common name	Scientific name	TSC Act	EPBC Act	Individual death or injury	Loss or disturbance to limiting of foraging resources	Loss or disturbance of breeding resources	Impact assessment applied?
Giant burrowing frog	*Heleioporus australiacus*	Vulnerable	Vulnerable	Potentially	Yes	Unlikely	Yes
Green and golden bell frog	*Litoria aurea*	Endangered	Vulnerable	Potentially	Yes	Unlikely	Yes
Black necked stork	*Ephippiorhynchus asiaticus*	Endangered	Not listed	No	Potentially	Unlikely	No
Australasian Bittern	*Botarus poiciloptilus*	Endangered	Endangered	No	Potentially	Unlikely	No
Spotted Harrier	*Circus assimilis*	Vulnerable	Not listed	No	Potentially	Potentially	No
Little Eagle	*Hieraaetus morphnoides*	Vulnerable	Not listed	No	Potentially	Potentially	No
Square Tailed Kite	*Lophoictinia isura*	Vulnerable	Not listed	No	Potentially	Potentially	No

Little lorikeet	*Glossopsitta pusilla*	Vulnerable	Not listed	No	Potentially	Potentially	No
Glossy black cockatoo	*Calyptorhynchus lathami*	Vulnerable	Not listed	No	Potentially	Unlikely	No
Barking Owl	*Ninox connivens*	Vulnerable	Not listed	No	Unlikely	Unlikely	No
Masked owl	*Tyto novaehollandiae*	Vulnerable	Not listed	No	Unlikely	Unlikely	No
Regent honeyeater	*Anthochaera phrygia*	Critically Endangered	Endangered	No	Potentially	Unlikely	No
Black chinned honeyeater	*Mellthreptus gulgaris*	Vulnerable	Not listed	No	Potentially	Potentially	Yes
Varied sittella	*Daphoenositta chrysoptera*	Vulnerable	Not listed	No	Potentially	Potentially	Yes
Flame Robin	*Petroica phoenicea*	Vulnerable	Not listed	No	Potentially	Potentially	Yes
Koala	*Phasolarctos cinereus*	Vulnerable	Vulnerable	No	Unlikely	Unlikely	Yes
Long Nosed Potoroo	*Potorous tridactylus*	Vulnerable	Vulnerable	No	Unlikely	Unlikely	Yes
Grey-headed Flying Fox	*Pteropus poliocephalus*	Vulnerable	Vulnerable	No	Unlikely	No	No

White throated needletail	*Hirundapus caudacutus*	Not listed	C,J,K	No	Unlikely	Potentially	No
Cattle Egret	*Ardea ibis*	Not listed	C,J	No	Potentially	Unlikely	No
Lathams snipe	*Gallinago hardwickii*	Not listed	C,J,K	No	Potentially	Unlikely	No
Rainbow bee eater	*Merops ornatus*	Not listed	J	No	Potentially	Unlikely	No
White bellied sea eagle	*Haliaeetus leucogaster*	Not listed		No	Potentially	Unlikely	No
Painted snipe	*Rhostratula benghalensis*	Endangered	C, Endangered	No	Potentially	Unlikely	No
Common sandpiper	*Actitis hypoleucos*	Not listed	C,J,K	No	Potentially	Unlikely	No

6. Recommendations

The following recommendations are suggested in order to mitigate and ameliorate the impacts of the proposal on threatened flora and fauna species and endangered communities:

Vegetation Removal:

- No *Dillwynia tenuifolia* is to be removed during the preparation for the development or through any activities taking place on the site.
- Most, if not all, exotic species should be removed and/or controlled in order to preserve the on-site habitat for threatened flora and fauna.
- Any construction/earthworks that are to be undertaken should adhere to the *Protection of Trees on Development Sites, AS4970-2009* (Standards Australia 2009).
- Any trimming of trees (which are to be retained on the site), to accommodate construction should be carried out by a qualified arborist.
- If any fauna is injured during vegetation removal WIRES should be called immediately.
- Vehicles and earthmoving machinery should only be parked in restricted areas in order to protect the off-site habitat surrounding the study site.
- In regards to the wetland habitat, all littoral vegetation should remain undisturbed and uncleared. This will provide suitable sheltering sites for fauna that use this habitat whilst maintaining the diversity of vegetation on the site.
- Retention of any littoral vegetation surrounding the wetland that may be utilised as shelter by migratory or wetland birds. This will ensure the integrity of the wetland habitat is maintained for sheltering and breeding sites for frogs and birds.

Offsetting the Impacts:

- An ecologist should be consulted by construction project managers and other associates should there be an issue with flora and fauna.

Maintenance:

- A protection area should be zoned around areas of heath vegetation surrounding the lake, in which the vulnerable flora species *Dillwynia tenuifolia* is present. If personnel or patrons use the area, they must have their movement restricted to the sandy track only, in addition to being supervised as they walk from the registration office to the game zones. Signage and fencing may be necessary to avoid the plants being trampled. Please refer to the figure 2 below identifying areas where *Dillwynia tenuifolia* is present.
- The natural ecosystem should be integrated into landscaping plans of the area.
- Any leaf litter and decorticating bark that is to be removed is to be placed into the natural bushland that is to be retained on the site.
- Activities are not to take place after operational hours, so as to avoid disturbance to nocturnal species.
- All areas that that have been impacted on by illegal dumping of rubbish, especially the large area containing broken bottles, should be cleaned up immediately in order to assure the safety of patrons using the site as well as protecting native fauna from injury

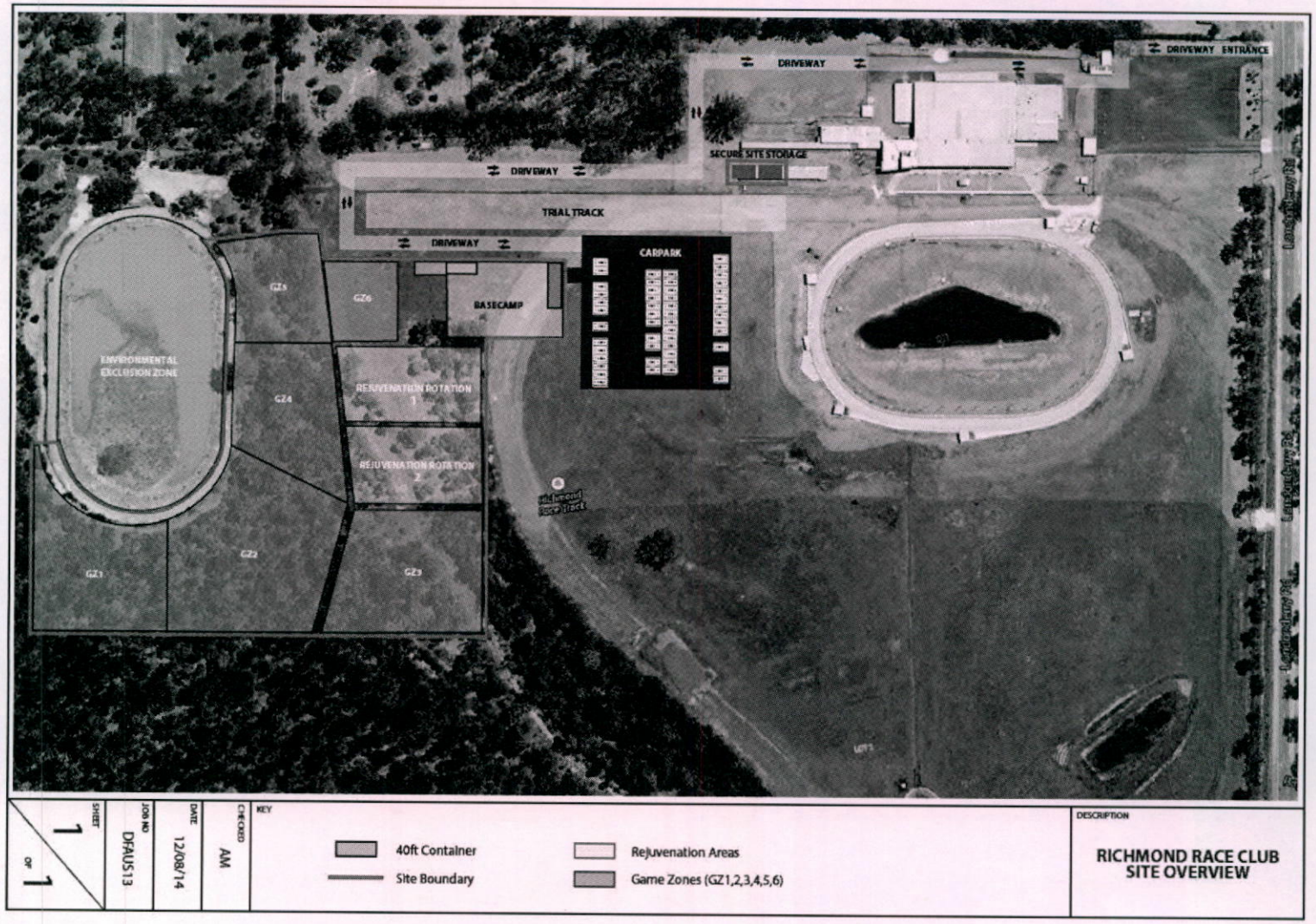

Figure 2: Map showing the restricted access area, within which Dillwynia tenuifolia *is located.*

7. Conclusion

This report assesses whether any threatened flora and fauna species, endangered populations and endangered ecological communities, are likely to be impacted upon by the proposed residential development. It addresses the *Threatened Species Conservation Act* (1995) and the *Environmental Protection and Biodiversity Conservation Act* (1999).

No threatened fauna species were found to be present on the site at the time of inspection, however habitat potential of the site for a number of threatened species is considered high. The vulnerable flora species *Dillwynia tenuifolia* was recorded on the site primarily in the area surrounding the lake. If managed properly, the proposed development should not affect the local survival of the threatened species. Other threatened flora species have suitable habitat represented on site. The Endangered Ecological Communities of *Cooks River Castlereagh Ironbark Forest* and *Castlereagh Scribbly Gum Woodland* both occur on the study site, however these communities are not considered to be significantly impacted upon by the proposal. Therefore a species impact statement (TSC Act) and a referral to the Minister (EPBC Act) is deemed **NOT** necessary.

A number of strategies are recommended to alleviate the impacts of this proposal and include:

- Protection of the lake and surrounding vegetation where vulnerable flora species *Dillwynia tenuifolia* was recorded.
- Signage and fencing as appropriate in order to protect the lake area and threatened vegetation as well as ensuring that no birds are mistreated during recreational activities.
- Removal of invasive weed species and ongoing control of weed invasion by a suitably qualified bush regenerator.
- Cleaning up of areas that have been prone to illegal dumping of rubbish.
- Ensuring that illegal dumping of rubbish is appropriately penalised.

8. References

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Department of the Environment (2012) Species profiles and threats database (online). Available from: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl [Accessed 18 September 2014].

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The Royal Botanic Gardens and Domain Trust (undated) New South Wales Flora Online. Available from: http://plantnet.rbgsyd.nsw.gov.au/ [Accessed 18 September 2014].

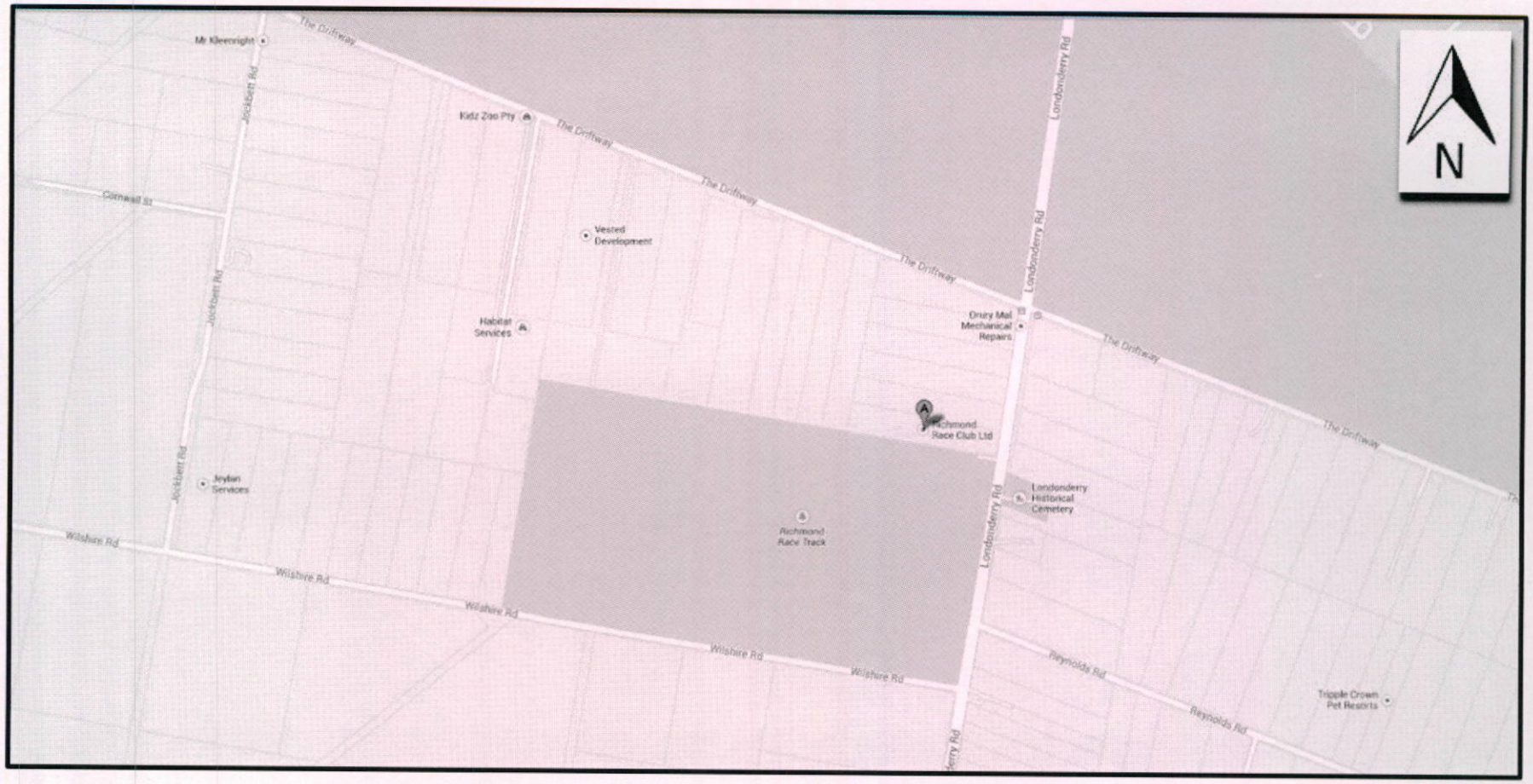

Figure 3: Map of 312 Londonderry Road, Londonderry

Figure 4: Aerial Map of 312 Londonderry Road, Londonderry

Figure 5: Vegetation map of 312 Londonderry Road, Londonderry (Six Maps Vegetation Viewer)

Cooks River Castlereagh Ironbark Forest

Castlereagh Scribbly Gum Woodland

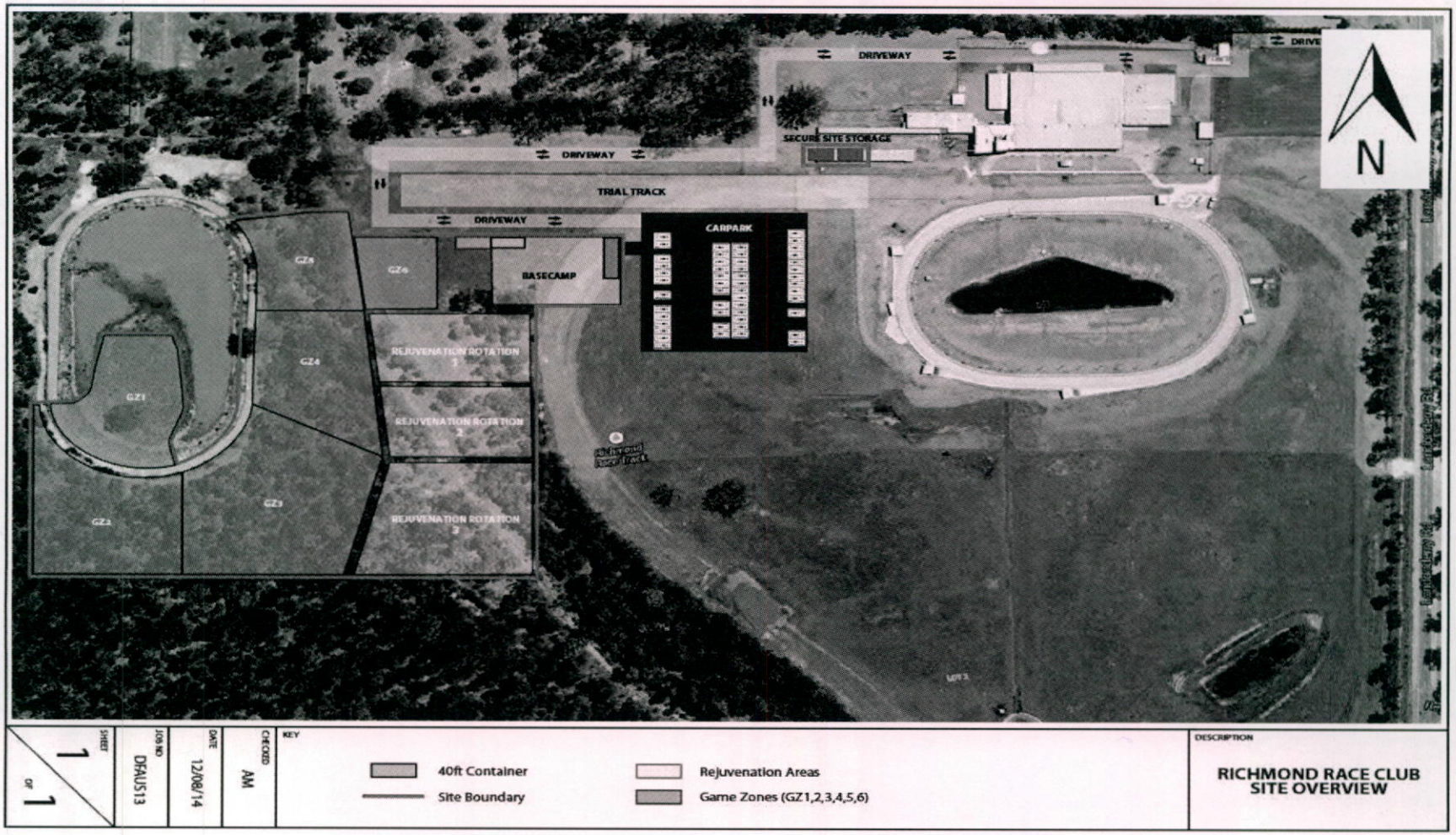

Figure6: Proposed design and layout of the paintball centre

Appendix 2: Species Recorded Onsite

Flora

* Denotes exotic species

Plant Family	Scientific Name	Common Name	Conservation/Weed Status
Apiaceae	*Hydrocotyle ranunculoides**	Floating Pennywort	Class 1 State Prohibited Weed
Apocynaceae	*Araujia sericifera**	Mothvine	Exotic
Asphodelaceae	*Aloe vera**	Aloe vera	Exotic
Asteraceae	*Calotis cuneifolia*	Purple Burr Daisy	Least Concern
Asteraceae	*Circium vulgare**	Spear Thistle	Exotic
Asteraceae	*Conyza sumatrensis**	Tall Fleabane	Exotic
Asteraceae	*Ozothamnus diosmifolius*	Rice Flower	Least Concern
Asteraceae	*Senecio madagascariensis**	Fireweed	Weed of National Significance
Bignoniaceae	*Jacaranda mimosifolia**	Jacaranda	Exotic
Brassicaceae	*Brassica* sp.	-	-
Cactaceae	*Opuntia stricta**	Prickly Pear	Weed of National Significance
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	Least Concern
Commelinaceae	*Commelina cyanea*	Native Wandering Jew	Least Concern
Cyperaceae	*Cyperus eragrostis**	Tall Flat Sedge	Exotic
Cyperaceae	*Lepidosperma laterale*	Variable Swordsedge	Least Concern
Ericaceae	*Lissanthe strigosa* subsp. *subulata*	Peach Heath	Least Concern
Fabaceae	*Acacia decurrens*	Black Wattle	Least Concern
Fabaceae	*Acacia elongata*	Slender Wattle	Least Concern
Fabaceae	*Acacia falcata*	Sickle Wattle	
Fabaceae	*Acacia floribunda*	Sally Wattle	Least Concern

Fabaceae	*Acacia parramattensis*	Parramatta Wattle	Least Concern
Fabaceae	*Acacia ulicifolia*	Prickly Moses	Least Concern
Fabaceae	*Daviesia ulicifolia* subsp. *ulicifolia*	Gorse Bitter Pea	Least Concern
Fabaceae	*Dillwynia retorta*	Heathy Parrot Pea	Least Concern
Fabaceae	*Dillwynia tenuifolia*	-	Vulnerable
Fabaceae	*Glycine tabacina*	Variable Glycine	Least Concern
Fabaceae	*Hardenbergia violaceae*	False sarsparilla	Least Concern
Fabaceae	*Indigofera australis*	Austral Indigo	Least Concern
Fabaceae	*Mirbelia rubiifolia*	Wallum Mirbelia	Least Concern
Fabaceae	*Senna pendula**	Broad-leaf Senna	Exotic
Fabaceae	*Trifolium fragiferum**	Red Clover	Exotic
Juncaceae	*Juncus usitatus*	Tassel Sedge	Least Concern
Lauraceae	*Cassytha glabella* forma *glabella*	Slender Devil's Twine	Least Concern
Lauraceae	*Cinnamomum camphora**	Camphor Laurel	Exotic
Lobeliaceae	*Pratia concolor*	-	Least Concern
Lomandraceae	*Lomandra longifolia*	Spiny Headed Matt Rush	Least Concern
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry	Least Concern
Malvaceae	*Sida rhombifolia**	Paddy's Lucerne	Exotic
Myrsinaceae	*Anagallis arvensis*	Red Pimpernel	Exotic
Myrtaceae	*Callistemon linearis*	Narrow-leaved Bottlebrush	Least Concern
Myrtaceae	*Eucalyptus fibrosa*	Red Ironbark	Least Concern
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum	Least Concern
Myrtaceae	*Melaleuca nodosa*	Prickly –leaved Paperbark	Least Concern

Myrtaceae	*Melaleuca styphelioides*	Thin-leaved Paperbark	Least Concern
Passifloraceae	*Passiflora edulis**	Passionfruit	Exotic
Phormiaceae	*Dianella longifolia* var. *longifolia*	Pale Flax Lily	Least Concern
Phytolaccaceae	*Phytolacca octandra**	Inkweed	Exotic
Pittosporaceae	*Bursaria spinosa*	Sweet Bursaria	Least Concern
Plantaginaceae	*Plantago lanceolata**	English Plantain	Exotic
Poaceae	*Andropogon virginicus*	Whisky Grass	Exotic
Poaceae	*Axonopus fissifolius*	Carpet Grass	Exotic
Poaceae	*Chloris truncata*	Australian Windmill Grass	Least Concern
Poaceae	*Ehrharta erecta**	Panic Veldtgrass	Exotic
Poaceae	*Eragostis brownii*	Brown Love Grass	Least Concern
Poaceae	*Eragrostis curvula**	African Lovegrass	Exotic
Poaceae	*Imperata cylindrica*	Blady Grass	Least Concern
Poaceae	*Microlaena stipoides*	Weeping Grass	Least Concern
Poaceae	*Phragmites australis*	Bamboo Grass	Least Concern
Poaceae	*Setaria pumila**	Yellow Foxtail	Exotic
Poaceae	*Themeda australis*	Kangaroo Grass	Least Concern
Polygonaceae	*Acetosa sagittata**	Turkey Rhubarb	Exotic
Proteaceae	*Hakea sericea*	Silky Hakea	Least Concern
Pteridaceae	*Cheilanthes distans*	Bristly Cloak Fern	Least Concern
Pteridaceae	*Cheilanthes sieberi* subsp. *sieberi*	Poison Rock Fern	Least Concern
Orchidaceae	*Caladenia catanata*	White Caladenia	Least Concern
Rosaceae	*Prunus armeniaca**	Apricot	Exotic
Rosaceae	*Rubus fruticosis**	Blackberry	Class 4 Noxious Weed. Weed of

			National Significance.
Rubiaceae	*Pomax umbellata*	-	Least Concern
Santalaceae	*Exocarpos cupressiformis*	Native Cherry	Least Concern
Solanaceae	*Solanum linnaeanum**	Apple of Sodom	Exotic
Solanaceae	*Solanum mauritianum**	Wild Tobacco	Exotic
Solanaceae	*Solanum nigrum**	Blackberry	Exotic
Solanaceae	*Solanum prinophyllum**	Forest Nightshade	Least Concern
Solanaceae	*Solanum pseudocapsicum**	Jerusalem Cherry	Exotic
Verbenaceae	*Lantana camara**	Lantana	Weed of National Significance

Fauna

Species recorded on the 17th of September, 2014:

Common Name	Scientific Name	Status	Observation Type
Birds			
Australasian Grebe	*Tachybaptus novaehollandiae*	Secure	Seen
Bell myna	*Manorina melanophrys*	secure	Heard
Bar Shouldered Dove	*Geopelia humeralis*	Secure	Seen
Black-faced Cuckoo-Shrike	*Coracina novaehollandiae*	Secure	Seen
Collared Sparrowhawk	*Accipiter cirrocephalus*	Secure	Seen
Crimson Rosella	*Platycercus elegans*	Secure	Heard
Galah	*Eolophus roseicapillus*	Secure	Seen
Indian Mynah	*Acridotheres tristis*	Introduced	Seen
Laughing Kookaburra	*Dacelo novaeguineae*	Secure	Heard
Lewins Honeyeater	*Meliphaga lewinii*	Secure	Heard
Little Black cormorant	*Phalacrocorax sulcirostris*	secure	Seen
Noisy Miner	*Manorina melanocephala*	Secure	Heard
Pied Cormorant	*Phalacrocorax varius*	Secure	Seen
Rainbow Lorikeet	*Trichoglossus haematodus*	Secure	Heard
Spotted Pardalotte	*Pardalotus punctatus*	Secure	Heard
Superb Fairywren	*Malurus cyaneus*	Secure	Seen
Torresian Crow	*Corvus orru*	Secure	Heard
White-browed Scrub wren	*Sericornis frontalis*	Secure	Seen
White-throated Tree Creeper	*Cormobates leucophaea*	Secure	Heard
Willy Wagtail	*Rhipidura leucophrys*	Secure	Seen
Yellow Thornbill	*Acanthiza nana*	Secure	Seen

Common Name	Scientific Name	Status	Observation Type
Herpetofauna			
Broad Palmed Frog	*Litoria latopalmata*	Secure	Seen
Common Eastern Froglet	*Crinia signifera*	Secure	Heard
Eastern Dwarf Tree frog	*Litoria fallax*	Secure	Heard
Eastern Water Skink	*Eulamprus quoyii*	Secure	Seen
Mammals			
Red Fox	*Vulpes vulpes*	Introduced	Scats/scent
Rabbit		Introduced	Scats/ burrows/ skull bone
Red-necked Wallaby	*Macropus rufogriseus*	Secure	Scats/prints in sand
Eastern Grey Kangaroo	*Macropus giganteus*	Secure	Scats

Species recorded on the 27th of February, 2014:

Family	Scientific name	Common name	Observation Type
	Introduced		
Canidae	*Vulpes vulpes*	Red fox	Scent
Leporidae	*Oryctolagus cuniculus*	European rabbit	Scats, diggings
	Aves		
Rhipiduridae	*Rhipidura fuliginosa*	Grey Fantail	Sighted
Cinclosomatidae	*Psophodes olivaceus*	Eastern whipbird	Call
		Little comorant	Sighted
Charadriidae	*Elseyornis melanops*	Black fronted dotterel	Sighted
		White faced heron	Sighted
Estrildidae	*Taeniopygia bichenovii*	Double bar finch	Sighted/Call
Estrildidae	*Neochmia temporalis*	Red browed finch	Sighted
Accipitridae	*Haliastur sphenurus*	Whistling kite	Sighted
Maluridae	*Malurus spp.*	Unidentified fairywren	Sighted
Corvidae	*Corvus orru*	Torresian crow	Sighted/Call
		Bell Minor	Call
Cacatuidae	*Calyptorhynchus spp.*	Unidentified black cockatoo	Sighted flying over habitat
		Currawong	
	Herpetofauna		
Mytrobatrachidae	*Crinia signifera*	Eastern froglet	Call
Mytrobatrachidae	*Crinia parinsignifera*	Eastern sign bearing frog	Call
Hylidae	*Litora fallax*	Eastern dwarf tree frog	Call
Agamidae	*Amphibolurus muricatus*	Jacky Dragon	Sighted
	Mammalia		
Macropodidae	*Macropus rufogriseus*	Red necked wallaby	Scat/Track
Macropodidae	*Macropus giganteus*	Eastern grey kangaroo	Scat/Sighted

Complete fauna species inventory:

Common Name	Scientific Name	Status	Observation Type
	Birds		
Australasian Grebe	*Tachybaptus novaehollandiae*	Secure	Seen
Bell miner	*Manorina melanophrys*	secure	Heard
Bar Shouldered Dove	*Geopelia humeralis*	Secure	Seen
Black-faced Cuckoo-Shrike	*Coracina novaehollandiae*	Secure	Seen
Black fronted dotterel	*Elseyornis melanops*	Secure	Sighted
Collared Sparrowhawk	*Accipiter cirrocephalus*	Secure	Seen
Crimson Rosella	*Platycercus elegans*	Secure	Heard
Double barred finch	*Taeniopygia bichenovii*	Secure	Sighted/Call
Eastern whipbird	*Psophodes olivaceus*	Secure	Call
Galah	*Eolophus roseicapillus*	Secure	Seen
Grey Fantail	*Rhipidura fuliginosa*	Secure	Sighted
Indian Mynah	*Acridotheres tristis*	Introduced	Seen
Laughing Kookaburra	*Dacelo novaeguineae*	Secure	Heard
Lewins Honeyeater	*Meliphaga lewinii*	Secure	Heard
Little Black cormorant	*Phalacrocorax sulcirostris*	secure	Seen
Noisy Miner	*Manorina melanocephala*	Secure	Heard
Pied Cormorant	*Phalacrocorax varius*	Secure	Seen
Rainbow Lorikeet	*Trichoglossus haematodus*	Secure	Heard
Red browed finch	*Neochmia temporalis*	Secure	Sighted
Spotted Pardalotte	*Pardalotus punctatus*	Secure	Heard
Superb Fairywren	*Malurus cyaneus*	Secure	Seen
Torresian Crow	*Corvus orru*	Secure	Heard

Common Name	Scientific Name	Status	Observation Type
Whistling kite	*Haliastur sphenurus*	Secure	Seen
White-browed Scrub wren	*Sericornis frontalis*	Secure	Seen
White faced heron	*Egretta novaehollandiae*	Secure	Seen
White-throated Tree Creeper	*Cormobates leucophaea*	Secure	Heard
Willy Wagtail	*Rhipidura leucophrys*	Secure	Seen
Yellow Thornbill	*Acanthiza nana*	Secure	Seen
	Herpetofauna		
Broad Palmed Frog	*Litoria latopalmata*	Secure	Seen
Common Eastern Froglet	*Crinia signifera*	Secure	Heard
Eastern Dwarf Tree frog	*Litoria fallax*	Secure	Heard
Eastern sign bearing frog	*Crinia parinsignifera*	Secure	Call
Eastern Water Skink	*Eulamprus quoyii*	Secure	Seen
Jacky Dragon	*Amphibolurus muricatus*	Sighted	Seen
	Mammals		
Red Fox	Vulpes vulpes	Introduced	Scats/scent
Rabbit		Introduced	Scats/ burrows/ skull bone
Red-necked Wallaby	Macropus rufogriseus	Secure	Scats/prints in sand
Eastern Grey Kangaroo	Macropus giganteus	Secure	Scats

Appendix 3: Detailed Description of Habitat Onsite

Cooks River Castlereagh Ironbark Forest/Castlereagh Scribbly Gum Woodland

Cooks River Castlereagh Ironbark Forest is an endangered ecological community often dominated by *Eucalyptus fibrosa* in the canopy layer, with the midstorey containing shrubs such as *Melaleuca nodosa* and an understorey made up of native peas and grasses.

It is present in areas of western Sydney and only 1011 ha of intact forest remains. The substrate is made up of clay soils deposited by ancient river systems and soils from the Wianamatta group of shale.

Threats to this community include:

- Urban and rural development
- Weed invasion
- Urban run-off
- Inappropriate fire regimes

Castlereagh Scribbly Gum Woodland is a vulnerable ecological community with *Eucalyptus parramattensis* often dominating the upperstorey, and *Melaleuca nodosa* and *Hakea sericea* common in the midstorey.

The substrate is composed of soils derived from Tertiary alluvium often on or near Holocene alluvium with sandy soils. The remaining habitat is mostly in small isolated fragments totalling 3083 ha.

Threats to the vulnerable ecological community include:

- Urban clearing
- Arson and hazard reduction fires
- Weed invasion
- Climate change
- Use of recreational vehicles
- Illegal dumping of rubbish

The site itself has all vegetation layers present and healthy. It has varying ecosystem types with some sections more heavily vegetated than others. There is swamp with heathland flora and sandy soils which provides habitat for the little black cormorant (*Phalacrocorax sulcirostris*), the pied cormorant (*Phalacrocorax varius*) and the broad palmed frog (*Litoria latopalmata*). The creek is home to the eastern dwarf tree frog (*Litoria fallax*) as well as many native bird species.

There are many native flora species all over the site as well as a number of weed species. Some areas of the site have been prone to illegal dumping of rubbish with large items like couches and sheet metal covering large areas of the site. One quite large part of the site was covered in broken bottles.

Plant species commonly found in Castlereagh Scribbly Gum Woodland include:

Acacia brownii
Acacia elongata
Angophora bakeri
Banksia spinulosa
Cassytha glabella subsp. *glabella*
Cheilanthes sieberi var. *sieberi*
Cyperus haspan subsp. *haspan*
Dianella revoluta subsp. *revoluta*
Drosera spatulata
Entolasia stricta
Eucalyptus parramattensis subsp. *parramattensis*
Gonocarpus micranthus
Hakea dactyloides
Hovea longifolia
Laxmannia gracilis
Leptospermum trinervium
Lomondra multiflora subsp. *multiflora*
Melaleuca nodosa
Microlaena stipoides var. *stipoides*
Micromyrtus minutiflora
Panicum simile
Pimelea linifolia subsp. *linifolia*
Schoenus paludosus
Stylidium graminifolium
Xanthorrhoea minor subsp. *minor*
Acacia bynoeana
Amphipogon strictus var. *strictus*
Aristida warburgii
Bursaria spinosa
Centrolepis strigosa
Cyathochaeta diandra
Daviesia ulicifolia
Dichondra repens
Eleocharis philippinensis
Eragrostis brownii
Eucalyptus sclerophylla
Gonocarpus tetragynus
Hakea sericea
Hypericum gramineum
Leptospermum contintale
Lepyrodia scariosa
Melaleuca decora
Melichrus urceolatus
Micromyrtus ciliata
Opercularia diphylla
Pimelea linifolia subsp. *collina*
Platysace ericoides
Sphaerolobium vimineum
Themeda australis

Plant species commonly found in Cooks River Castlereagh Ironbark Forest are:

Acacia binervia

Acacia falcata

Angophora bakeri

Angophora floribunda

Aristida ramosa

Aristida vagans

Astroloma humifusum

Austrodanthonia setacea

Austrodanthonia tenuior

Austrostipa pubescens

Austrostipa rudis

Billardieria scandens

Boronia polygalifolia

Bursaria spinosa

Calotis cuneifolia

Cassinia arcuata

Cassytha glabella forma *glabella*

Cheilanthes sieberi subsp. *sieberi*

Dianella revoluta

Dichelachne micrantha

Dillwynia parviflora

Dillwynia sieberi

Einadia nutans

Einadia trigonos

Eragrostis brownii

Eucalyptus capitellata

Eucalyptus fibrosa

Eucalyptus longifolia

Eucalyptus moluccana

Eucalyptus resinifera

Exocarpos cupressiformis

Glycine clandestina

Gonocarpus tetragynus

Goodenia belledifolia

Goodenia hederacea subsp. *hederacea*

Goodenia paniculata

Hakea sericea

Hibbertia empetrifolia

Hibbertia serpyllifolia

Kunzea ambigua

Laxmannia gracilis

Laxmannia gracilis

Lepidosperma laterale

Leptospermum trinervium

Leucopogon juniperinus

Lissanthe strigosa

Lomandra longifolia

Lomandra multiflora subsp. *multiflora*

Melaleuca decora

Melaleuca decora

Melaleuca nodosa

Microlaena stipoides

Microtis parviflora

Notelaea longifolia

Opercularia diphylla

Orthoceras strictum

Ozothamnus diosmifolius

Ozothamnus diosmifolius

Panicum simile

Paspalidium distans

Podolobium ilicifolium

Pomax umbellata

Poranthera microphylla

Pratia purpurascens

Pultenaea villosa

Rhytidosporum procumbens

Stackhousia viminea

Syncarpia glomulifera

Thelymitra pauciflora

Themeda australis

Vernonia cinerea var. cinerea

Wahlenbergia gracilis

Xanthorrhoea media

Entolasia stricta

Appendix 4: Assessment of significance

Endangered Ecological Communities

Cooks River Castlereagh Ironbark Forest

Under Section 5A of the *Environmental Planning and Assessment Act 1979* (as amended) a Seven Part Test is Required to determine *"whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats"* listed on Schedules 1 or 2 of the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required.

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

This test is for a critically endangered ecological community.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of species is likely to be placed at risk of extinction:

Not applicable. This test is for a critically endangered ecological community

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

It is unlikely that the action proposed will have an adverse effect on the community to the extent that it will become locally extinct. Very little clearing is needed for the proposed development and the weed removal that will be necessary will most likely benefit the community.

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

No. While the present condition of the vegetation on the site is diverse and consists of intact herbaceous, understory and canopy trees, the small amount of modification involved in the site will not place the local occurrence of the community at risk of extinction.

(d) In relation to the habitat of a threatened species, population or ecological community;
(i) The extent to which habitat is likely to be removed or modified as a result of the action proposed:

The extent that the habitat is likely to be removed or modified is very small. The endangered community will continue to persist in areas both on and off site.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action;

It is unlikely that habitat for the endangered ecological community will be fragmented or isolated as very little modification of the vegetation community will occur.

(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality:

Very little, if any, habitat is to be removed therefore the proposed development will not affect the long term survival of the ecological community.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly):

There is no critical habitat present on the site.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan:

As long as the removal of native vegetation remains minimal, the proposed development is consistent with the recovery plan.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process:

Key threatening processes for Cooks River Castlereagh Ironbark Forest include:

- Further clearing for urban/rural residential development or clay/shale extraction, and the subsequent impacts from fragmentation.
- Urban run-off, which leads to increased nutrients and sedimentation.
- Weed invasion.
- Inappropriate fire regimes, which have altered the appropriate floristic and structural diversity

Conclusion: The proposed action is not likely to have a significant effect on the *Cooks River Castlereagh Ironbark Forest*. Therefore a Species Impact Statement is **not** deemed to be required.

Under Section 5A of the *Environmental Planning and Assessment Act 1979* (as amended) a Seven Part Test is Required to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" listed on Schedules 1 or 2 of the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required.

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

This test is for a critically endangered ecological community.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of species is likely to be placed at risk of extinction:

Not applicable. This test is for a critically endangered ecological community

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

The extent that the habitat is likely to be removed or modified is very small. The endangered community will continue to persist in areas both on and off site.

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

No. While the present condition of the vegetation on the site is diverse and consists of intact herbaceous, understory and canopy trees, the small amount of modification involved in the site will not place the local occurrence of the community at risk of extinction.

(d) In relation to the habitat of a threatened species, population or ecological community;
(i) The extent to which habitat is likely to be removed or modified as a result of the action proposed:

The extent that the habitat is likely to be removed or modified is very small. The vulnerable community will continue to persist in areas both on and off site.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action;

It is unlikely that habitat for the endangered ecological community will be fragmented or isolated as very little modification of the vegetation community will occur.

(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality:

Very little, if any, habitat is to be removed therefore the proposed development will not affect the long term survival of the ecological community.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly):

There is no critical habitat present on the site.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan:

As long as the removal of native vegetation remains minimal, the proposed development is consistent with the recovery plan.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process:

Key Threatening Processes for Castlereagh Scribbly Gum Woodland include:

- Urban clearing
- Arson and hazard reduction fires
- Weed invasion
- Climate change
- Use of recreational vehicles
- Illegal dumping of rubbish

Conclusion: The proposed action is not likely to have a significant effect on the *Castlereagh Scribbly Gum Woodland*. Therefore a Species Impact Statement is **not** deemed to be required.

Flora

Shrubs

Acacia bynoeana
Acacia pubescens
Allocasuarina glareicola
Dillwynia tenuifolia
Grevillea juniperina subsp. *juniperina*
Leucopogon exolasius
Micromyrtus minutiflora
Persoonia hirsuta
Pimelea curviflora var. *curviflora*
Pultenaea parviflora

Under Section 5A of the *Environmental Planning and Assessment Act 1979* (as amended) a Seven Part Test is Required to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" listed on Schedules 1 or 2 of the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required.

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

The proposed action should not threaten local populations of these species as the development is unlikely to require much clearing. The threatened species *Dillwynia tenuifolia* was recorded on site, however it was only present at the lake area and if managed properly it should not be disturbed by activities on the site.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of species is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(d) In relation to the habitat of a threatened species, population or ecological community;
(i) The extent to which habitat is likely to be removed or modified as a result of the action proposed:

The proposed action does require intense modification of the vegetation on the site. It is likely that the weeding required for the development will benefit the habitat present as long as most native species are not removed.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action:

It is unlikely that the development will cause fragmentation of habitat as little clearing is necessary.

(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality:

As there is very little clearing involved in the proposed development it is very unlikely that it will affect long the long term survival of the vulnerable species *Dillwynia tenuifolia*, or the listed threatened species with suitable habitat represented on site.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly):

There is no critical habitat present on the site.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan:

No recovery plan is required for *Allocasuarina glareicola, Dillwynia tenuifolia, Grevillea juniperina* subsp. *juniperina, Leucopogon exolasius, Micromyrtus minutiflora, Persoonia hirsuta, Pimelea curviflora* var. *curviflora*, or *Pultenaea parviflora*. A recovery plan is in preparation for *Acacia bynoeana*. There is a recovery plan for *Acacia pubescens* and suggests that if plants are present they should be fenced for protection.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process:

Key threatening processes for these species that may be caused or exacerbated by the proposed development include:

- Weed invasion
- Habitat disturbance and degradation including illegal dumping
- Illegal and accidental clearing
- Uncontrolled vehicular access
- Habitat degradation through recreational activities

Conclusion: The proposed action is **not** likely to have a significant effect on the threatened species *Acacia bynoeana, Acacia pubescens, Allocasuarina glareicola, Dillwynia tenuifolia, Grevillea juniperina* subsp. *juniperina, Leucopogon exolasius, Micromyrtus minutiflora,*

Persoonia hirsuta, Pimelea curviflora var. *curviflora,* or *Putenaea parviflora*. A Species Impact Statement is **not** deemed to be required.

Fauna

Frogs

Giant Burrowing Frog (*Heleioporus australiacus)*
Green and Golden Bell Frog (*Litoria aurea)*

Under Section 5A of the *Environmental Planning and Assessment Act* (1979) (as amended) a Seven Part Test is Required to determine *"whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats"* listed under Schedules 1 or 2 of the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required.

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

Changing the land use of the site to accommodate for a paint ball field may cause death or injury to some frogs whilst wintering, from being trampled.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of species is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(d) In relation to the habitat of a threatened species, population or ecological community;
(i) The extent to which habitat is likely to be removed or modified as a result of the action proposed:

The bushland habitat onsite may be degraded over time as a result of soil compaction and from vegetation being trampled. It could reduce the quality of over wintering and terrestrial habitat.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action:

The area of habitat is bounded by rural holdings that are scattered with pockets of native vegetation. The change in land use from vacant bushland to a paint ball facility may disturb areas of terrestrial habitat or make these areas 'unattractive' for individuals to shelter in. This would be due to higher levels of vibration, soil compaction and general disturbances.

(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality:

The habitat provides suitable foraging and overwintering habitat for these frog species. It is unlikely that a significant amount of habitat will be removed to accommodate for the development, however some areas may become highly disturbed during operational times.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly):

There is no critical habitat present on the site.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan:

The Giant Burrowing Frog is listed as a species that requires a recovery plan to be prepared. Thus, the action proposed is likely to exacerbate the threats facing this species.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process:

Key Threatening Processed for the Giant Burrowing Frog are:

- *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition;*
- *Predation by the European Red Fox Vulpes Vulpes*
- *Predation by the Feral Cat, Felis catus*
- *Loss of Biodiversity as a result of loss and/or degradation of habitat following clearing and fragmentation of native vegetation (currently a preliminary determination)*

Key Threatening Processed for the Green and Golden Bell Frog are:

- *Predation by Gambusia holbrooki (Plague Minnow or Mosquito Fish)*
- *Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands.*
- *Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process);*
- *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition;*
- *Predation by the European Red Fox Vulpes vulpes (Linnaeus 1758)*
- *Chytridiomycosis,*

To a small degree, the proposal may contribute towards a number of the above listed Key Threatening Processes.

Conclusion: The proposed action is not likely to have a significant effect on *H. australiacus*, and *L. aurea*. A species impact statement is deemed **not** be required.

Small Forest Birds

Black chinned honeyeater *Mellthreptus gulgaris*
Varied sittella *Daphoenositta chrysoptera*
Flame Robin *Petroica phoenicea*

Under Section 5A of the *Environmental Planning and Assessment Act* (1979) (as amended) a Seven Part Test is Required to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" listed under Schedules 1 or 2 of the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required.

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

These three species may potentially use the site for foraging and breeding resources. Operating a paint ball facility may cause seasonal disturbances to breeding from increased noise and stress to individuals. The site may become less 'attractive' for breeding and foraging and individuals may need to seek offsite resources.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of species is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(d) In relation to the habitat of a threatened species, population or ecological community;
(i) The extent to which habitat is likely to be removed or modified as a result of the action proposed:

Habitat is not likely to be removed, however species may be less likely to choose nesting sites within the habitat provided. There may also be changes in the amount of time spent foraging within the site, due to increased vigilance.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action:

Habitat is not likely to become increasingly fragmented as a result of the development, however species may be less likely to use the site due to increased disturbances.

(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality:

These species are mobile and are likely to use resources on and off the site. It is not likely to result in death of individually, but it is likely that a small portion of these species habitat will become unsuitable for nesting due to disturbances. The habitat will also decrease in its foraging value as species are more likely to display increased vigilance at the expense of time spent foraging.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly):

There is no critical habitat present on the site.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan:

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process:

Key Threatening Processes for the Black chinned honeyeater *Mellthreptus gulgaris* are:

- *Clearing of remnant open forest and woodland habitat.*
- *Poor regeneration of open forest and woodland habitats because of intense grazing.*
- *May be excluded from smaller remnants by aggressive species such as the Noisy Miner (Manorina melanocephala).*

Key Threatening Processes for the Varied sittella *Daphoenositta chrysoptera* are:

- *Apparent decline has been attributed to declining habitat. The sedentary nature of the Varied Sittella makes cleared land a potential barrier to movement.*
- *The Varied Sittella is also adversely affected by the dominance of Noisy Miners in woodland patches*
- *Threats include habitat degradation through small-scale clearing for fencelines and road verges, rural tree decline, loss of paddock trees and connectivity, 'tidying up' on farms, and firewood collection.*

Key Threatening Processes for the Flame Robin *Petroica phoenicea* are:

- *Clearing and degradation of breeding habitat.*
- *Degradation of wintering habitat.*
- *Degradation and simplification of habitat by overgrazing and removal of standing dead timber, logs and coarse woody debris.*
- *Nest predation by native and exotic predators, including artificially large populations of Pied Currawong (Strepera graculina) in some areas.*
- *Habitat for this species may become unsuitable if dense regeneration occurs after bushfires or other disturbances.*

Conclusion: The proposed action is **not** likely to have a significant effect on the Black chinned honeyeater *Mellthreptus gulgaris*, the Varied sittella *Daphoenositta chrysoptera*
And the Flame Robin *Petroica phoenicea*

A species impact statement is deemed **not** to be required.

Mammals

Grey headed flying fox *Pteropus poliocephalus*

Under Section 5A of the *Environmental Planning and Assessment Act* (1979) (as amended) a Seven Part Test is Required to determine "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*" listed under Schedules 1 or 2 of the *Threatened Species Conservation Act 1995*, and consequently, whether a Species Impact Statement is required.

(a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

This species is highly mobile and able to seek offsite resources. No Flying Fox 'camps' were identified onsite.

There is suitable habitat for this species in nearby remnants, such as Agnes Banks Nature Reserve. It is unlikely that this species will be placed at risk of extinction as a result of the proposal.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of species is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
(i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction:

Not applicable. This test is for threatened species.

(d) In relation to the habitat of a threatened species, population or ecological community;
(i) The extent to which habitat is likely to be removed or modified as a result of the action proposed:

No Flying Fox 'camp' was identified onsite. Since no clearing of vegetation is proposed, and that the activities which are likely to disrupt the species are only during daytime operational hours (when the flying fox is absent from the site), the development shall not impact on any habitat of this species.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action:

The area of habitat is bounded by rural holdings that are scattered with pockets of remnant native vegetation. Additionally, Agnes Banks Nature Reserve is south west of the property. Although the habitat onsite does contribute to connectivity across the landscape, it is unlikely to disconnect existing habitats.

(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species, population or ecological community in the locality:

This species is mobile and likely to use resources on and off the site. The development itself shall not significantly alter the species habitat, given that disruptions will occur during the day when this species is absent from the site (returning to base camps). The proposed development is unlikely to threaten the long term survival of these species.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly):

There is no critical habitat present on the site.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan:

The removal of vegetation is not consistent with the objectives or actions of any plan.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process:

Key Threatening Processes for the Grey Headed Flying Fox are:

- *Loss and disturbance of roosting sites.*
- *Unregulated shooting.*
- *Electrocution on powerlines, entanglement in netting and on barbed-wire.*
- *Competition with Black Flying-foxes.*
- *Negative public attitudes and conflict with humans.*
- *Impacts from climate change.*
- *Disease.*

The proposed development is unlikely to significantly contribute towards any of these key threats.

Conclusion: The proposed action is **not** likely to have a significant effect on *P. poliocephalus*. A species impact statement is deemed **not** be required.

Appendix 5: EPBC Act Considerations

An assessment of the impact of the proposed development upon threatened species, populations, ecological communities, World Heritage values, and migratory species listed under the *Environment Protection and Biodiversity Conservation Act 1999* are listed below.

Impacts on threatened species and ecological communities

An action has, will have, or is likely to have a significant impact on a threatened species if it does, will, or is likely to:

- Lead to a long-term decrease in the size of a population
- Reduce the area of occupancy of the species
- Fragment an existing population into two or more populations
- Adversely affect habitat critical to the survival of a species
- Disrupt the breeding cycle of a population
- Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline
- Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species habitat; or
- Interfere with the recovery of the species

Critically endangered and endangered species

No critically endangered species were observed on the subject site, however potential habitat exists for the endangered species Australasian bittern *Botarus poiciloptilus*, Regent Honeyeater *Anthochaera phrygia* and flora species *Allocasuarina glareicola* and *Persoonia hirsuta*.

It is considered that the proposed development will not disrupt the lifecycle of these species such that any potentially viable local population would be placed at increased risk of extinction. The potential impacts of the proposed development is not likely to lead to significant exacerbation of those points listed above.

Vulnerable Species

No vulnerable species were recorded at the study site. Potential habitat however, exists for fauna species: the Giant burrowing frog *Heleioporus australiacus*, Green and golden bell frog *Litoria aurea*, Grey headed flying fox *Pteropus poliocephalus*, and flora species: *Pultenaea*

parviflora, Acacia bynoeana, Acacia pubescens, Micromyrtus minutiflora, and *Pimelea curviflora* var. *curviflora*.

It is considered that the proposed development will not disrupt the lifecycle of these species such that any potentially viable local population would be placed at increased risk of extinction. The potential impacts of the proposed development is not likely to lead to significant exacerbation of those points listed above.

Critically endangered and endangered ecological communities

An important population is one that it necessary for a species long term survival and recovery. This may include populations that are:

- Key source populations either for breeding or dispersal
- Populations that are necessary for maintaining genetic diversity; and/or
- Populations that are near the limit of the species range.

The endangered ecological community of Cooks River Castlereagh Ironbark Forest was recorded at the study site. However, the proposed development will only impact a small portion of the area, and the endangered ecological community can continue to persist on site and in the surrounding areas. It is believed that the proposed development will not disrupt the lifecycle of this community such that any potentially viable local population would be placed at increased risk of extinction.

Castlereagh Scribbly Gum Woodland was also recorded on the site, but very little disturbance will occur to the community as it is predominately outside the impact zone. The proposed development does not occur within this community and it is not at an increased risk of extinction from the action.

Impacts on migratory species

An action has, will have, or is likely to have a significant impact on a migratory species if it does, will, or is likely to:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species;
- Result in invasive species that are harmful to the migratory species, and prevent the species becoming established in an area of important habitat;
- Seriously disrupt the lifecycle (breeding, feeding, migration or nesting behaviour) of an ecologically significant proportion of the population of the species.

An area of important habitat is:

- Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant portion of the population of the species
- Habitat utilised by a migratory species which is at the limit of the species range; or
- Habitat within an area where the species is declining.

Of the fourteen (14) migratory species likely to occur within a 10km radius of the site, seven (7) species are considered to have habitat onsite. These are the Rainbow Bee-eater (*Merops ornatus),* the Cattle Egret *(Ardea ibis)* Latham's Snipe (*Gallinago hardwickii),* White- bellied Sea Eagle (*Haliaeetus leucogaster),* the Painted Snipe *(Rostratula australis)* and the Common Sandpiper (*Actitis hypoleucos*).

The Rainbow Bee-eater could forage in the airspace above the site. This species is an aerial insectivore that occurs throughout Australia, with southern populations migrating north during the winter months.

The Great Egret, Latham's Snipe, Painted Snipe and Common Sandpiper are all likely to utilise the wetland area for feeding. Species such as the Painted and Latham's Snipes require dense vegetation near the water's edge as daytime cover and therefore will be impacted upon if shrubbery around the wetland is disturbed. However this is not within the scope of the development. Latham's Snipe and the Common Sandpiper do not breed within Australia. It is unlikely that the Great Egret or Painted Snipe would utilise this site for breeding. The disturbance to these species by the proposed development is not considered significant and it will not increase their likelihood of local extinction.

The White- bellied Sea Eagle is unlikely to utilise this wetland area on a frequent basis due to its small size. It may however reside in the immediate area, feeding and breeding in a wider territory encompassing the site.

The proposed development will not significantly decrease habitat available for these species, or disrupt the lifecycle of these species such that viable populations are likely to be placed at risk of extinction. The proposed development is therefore not likely to have a significant impact on these species and is not likely to result in any points listed above under the migratory species provisions of the EPBC Act.

EPBC Act Assessment

- The proposed action will not significantly impact on any the 5 flora and 10 fauna species listed under the EPBC Act and recorded within a 10km radius of the site.
- The proposed action will not significantly impact on the 7 migratory species that are listed under the EPBC Act and recorded within a 10km radius of the site.
- The proposed action will not have a significant impact upon the endangered ecological communities of *Cooks River Castlereagh Ironbark Forest* or *Castlereagh Scribbly Gum Woodland*.

Referral Recommendation

The proposed development will **not** require referral to the Commonwealth Minister for the Environment for consideration under the EPBC Act.

PROPOSED OUTDOOR PAINTBALL RECREATIONAL/SPORTING FACILITY

312 Londonderry Road, Londonderry

Traffic & Parking Impact Report

Prepared for: Delta Force Properties (Pty) Ltd

A1414025N

October 2014

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ABN 69 981 485 197

1. INTRODUCTION

ML Traffic Engineers was commissioned by Delta Force Properties (Pty) Ltd to undertake a car-parking & traffic impact assessment for a proposed outdoor paintball recreational/sporting facility at 312 Londonderry Road, Londonderry. It can be demonstrated that the present number of on-site parking spaces could be sufficient for the proposed use.

Richmond Greyhound Racing Club will be upgrading an existing car park for the exclusive use of Delta Force. As part of the lease agreement Richmond GRC will be upgrading this car park and connecting driveway with a crushed rock surface.

In the course of preparing this report, the subject site and its environs have been inspected, plans of the proposal examined, and all relevant traffic and parking data collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS

2.1 Location and Land Use

The subject site is located on the west side of Londonderry Road, within the compounds of the Richmond Race Club, as shown in Figure 1 overleaf. The surrounding land uses (rural) are mainly paddocks and hobby farms.

The existing greyhound racing facility operates on designated *race* and *trialing* days. Operating hours on *race* days are Monday between 10am & 3pm and Friday between 6pm & 10.30pm. Operating hours on *trialing* days are Tuesday between 9am & 11am, Wednesday between 8am & 2pm and Sunday between 9am and mid-day.

There are 2 parking areas associated with the race club – a sealed area in the front section of the property with its own access driveway from Londonderry Road, and an unsealed area in the middle/rear section of the property with a separate & longer access driveway from Londonderry Road.

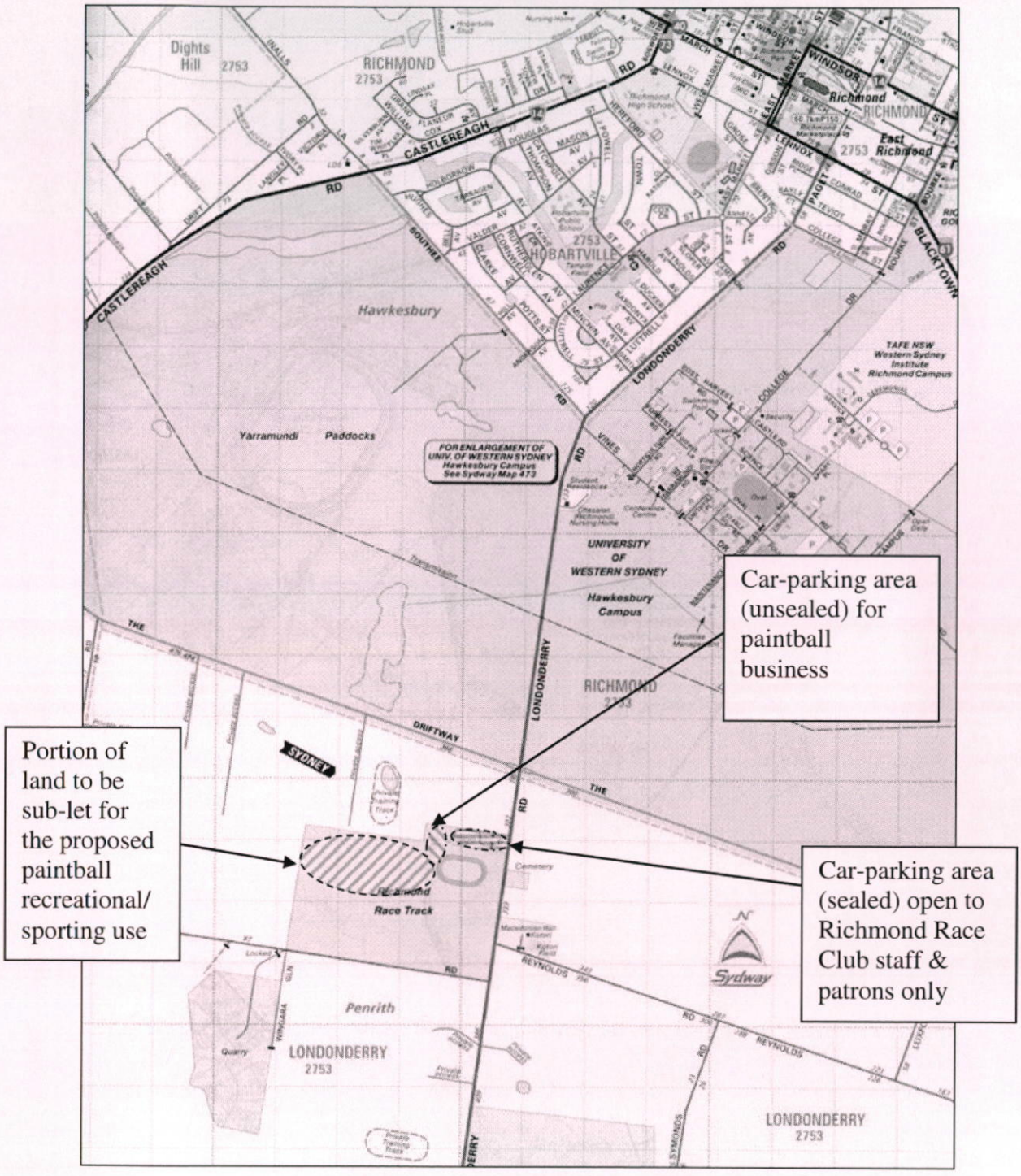

Figure 1: Location of the Subject Site

2.2 Road Network

Londonderry Road is an undivided rural arterial road with a north/north-east to south/south-west orientation. The road is one lane each way near the development site has a road shoulder and a dashed centre line divides the opposing lanes. The speed limit is 60km/hr. Figure 2 presents a photograph of Londonderry Road looking south.

Figure 2: Londonderry Road looking south

Figure 3: Existing Entrance and Exit to the Richmond Race Club

2.3 Existing Parking Conditions

ML Traffic Engineers commissioned Australasian Traffic Surveys to undertake a survey of the unsealed parking area, accessible via a long driveway from Londonderry Road. It is proposed to share this parking area with the Richmond Race Club.

The surveys were carried out as part of the previous Development Application. Discussions with the Race Club suggests that there has not been a significant increase in usage and in fact there has been a marginal decrease over time as a consequence of changes in people's entertainment habits (greater internet usage, video gaming etc) and an aging membership of the Race Club has led to a slow decrease in usage. Social demographic and technology changes are affecting usage of the race club. The survey is a worst case for attendance.

The survey period covered a weekend *trialing* day for the Richmond Race Club and a high patronage period (not as high as a Saturday) for the proposed paintball recreational use.

Figure 4 below presents the coverage of the parking surveys.

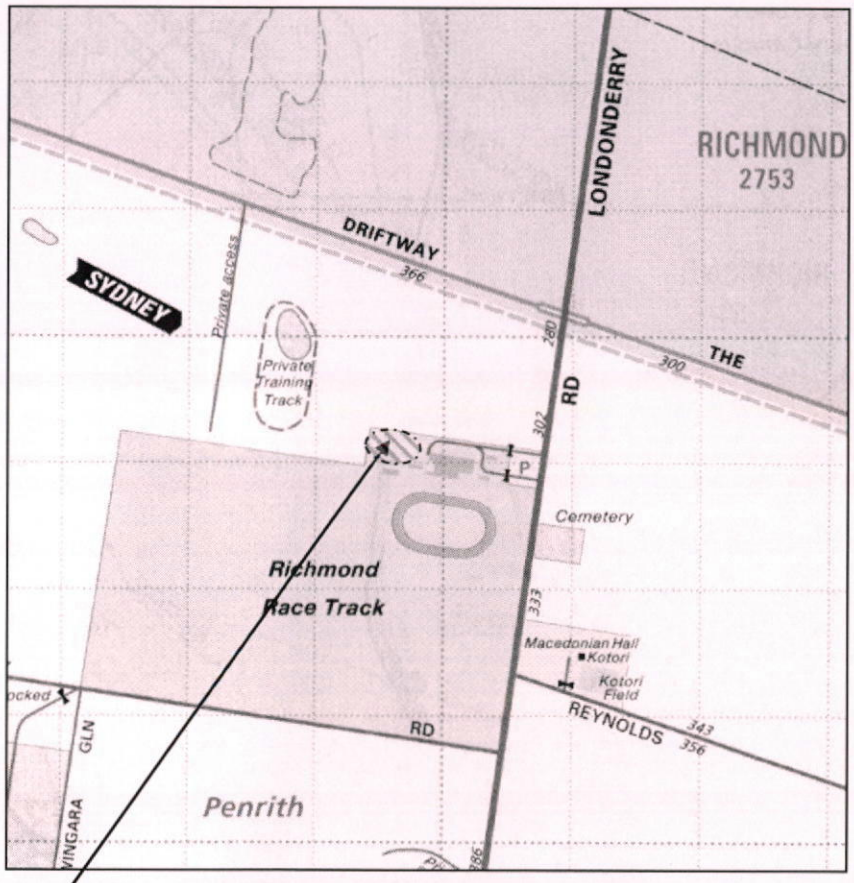

Figure 5: Parking Survey Locations

Unsealed parking area –for paintball business

The parking area has a capacity of approximately 150 to 170 vehicles, depending on the number of vehicles with trailers and how tightly the vehicles are parked.

Table 1 presents a summary of vehicle movements & parking accumulation for the site. At 9am, there were 51 vehicles parked on site. At 12pm, all vehicles had left the site.

TIME PERIOD	VEHICLE MOVEMENT		PARKING ACCUMULATION
	IN	OUT	
9:00 - 10:00	3	14	40
10:00 - 11:00	2	28	14
11:00 - 12:00	0	14	0
≅	5	56	

Table 1: Parking Accumulation Summary at the Richmond Race Club

Figure 5 illustrates vehicles the parking area at 9am on Sunday morning, at the start of the 3-hour greyhound *trialing* period.

Figure 5: Sunday Morning Parking at 9am

2.4 Traffic Volumes

Traffic counts were undertaken at the nearby intersection of Londonderry Road with The Driftway on the weekday AM and PM peak hour and Saturday peak hour (11am to midday). The weekday peak hours are 7:45am -8:45am and 3pm to 4pm and coincide with the opening and (staff arrivals mainly) and final departure hour of a weekday. The following Figures present the traffic volumes in vehicle numbers. The traffic volumes were collected on the 19th and 20th September 2014 for the weekday AM and PM peak hours (8am to 9am and 5pm to 6pm) and the Saturday peak hour (11am to midday). The peak hours reflect the peak periods of the paintball usage. The following Figures present the traffic volumes in vehicle numbers.

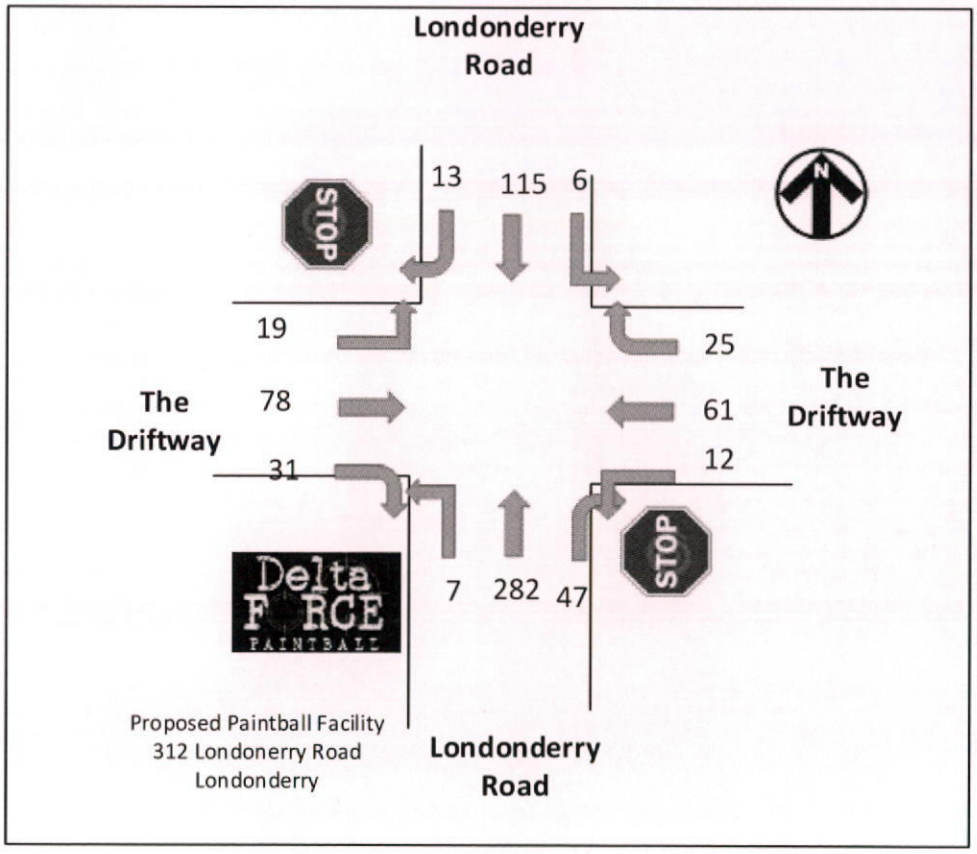

Figure 6: Weekday AM Peak Hour Traffic Volumes

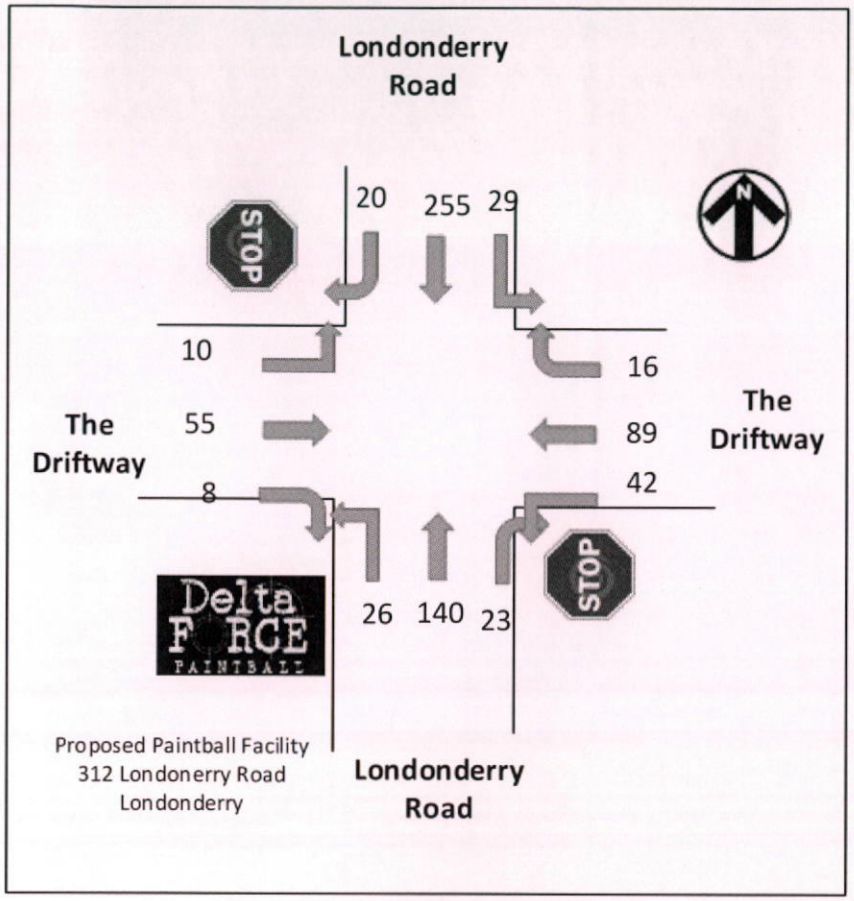

Figure 7: Weekday AM Peak Hour Traffic Volumes

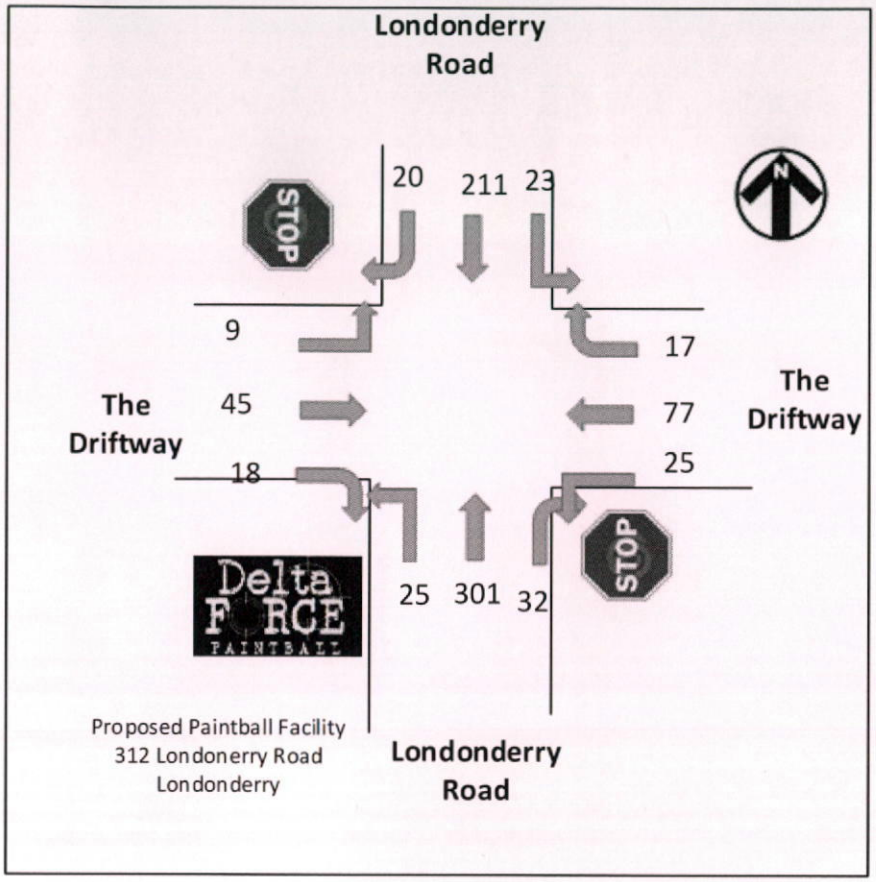

Figure 8: Saturday Peak Hour Traffic Volumes

2.5 Intersection Description

The stop control intersection of Londonderry Road with The Driftway is a four leg intersection with drivers on The Driftway need to stop and give way to traffic on Londonderry Road. This intersection is assessed. Figure 8 presents the layout of the intersection using SIDRA – an industry standard intersection software package.

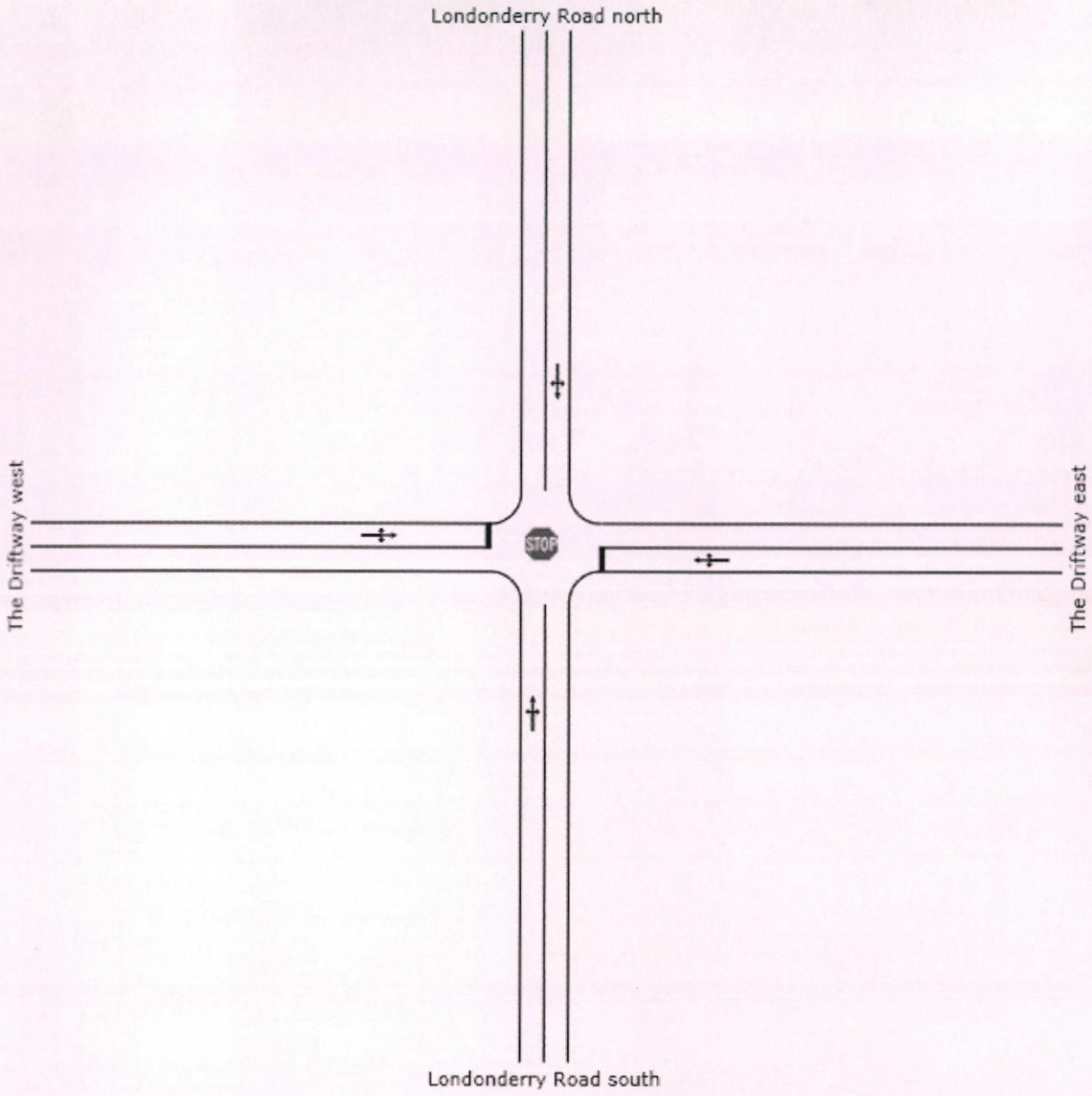

Figure 9: Stop Control Intersection Layout of Londonderry Road with The Driftway (SIDRA)

2.6 Intersection Assessment

The existing intersection operating performance of the surveyed intersection for the peak hours was assessed using the SIDRA software package (version 6) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection.

The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and signalised control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 45-49
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as presented below:

- All turn movements have a LoS A or B for the three peak hours

The full SIDRA outputs are presented in Appendix A for the existing conditions.

2.7 Public Transport

The site is located to bus services on Londonderry Road and provides a link to Richmond, Londonderry and to Penrith – see Figure 10.

The bus service will most likely suit staff than customers who generally car share as part of a group activity at the paintball facility.

The site has access to good public transport options considering the rural environment.

2.8 Conclusions

There is spare capacity at the nearby intersection near the proposed development.

The proposed development has good access to public transport.

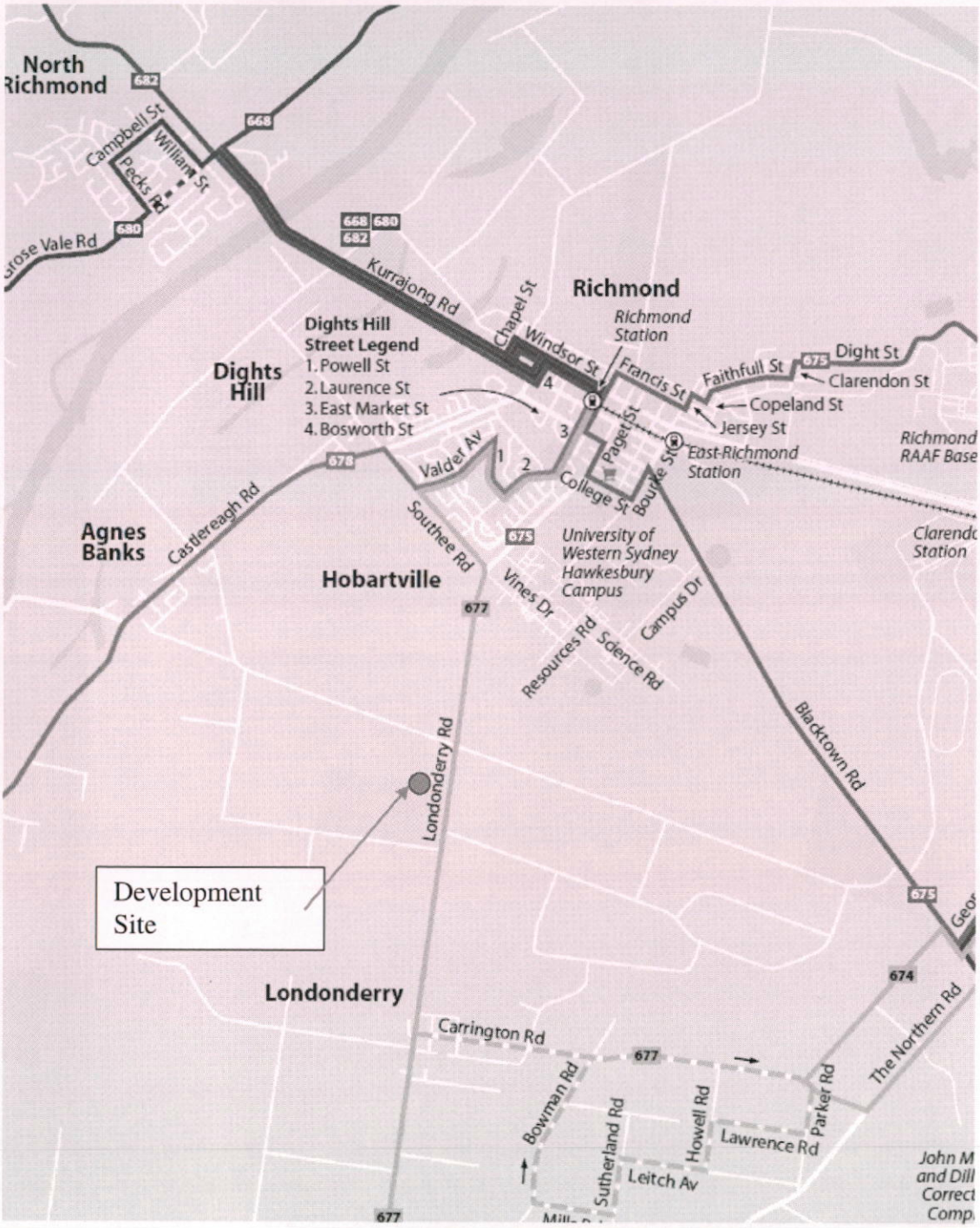

Figure 10: Bus Service 677 services Londonderry Road corridor

3. PROPOSAL

The proposal is to lease a portion (approximately 16 Ha) of the Richmond Race Club site for the purpose of facilitating paintball outdoor recreation. Paintball is a group activity with players in teams of 10 to 40 adults. It is a mixture of hide, seek and tag. Facilities are generally located in rural environments, due to the large land requirement. As such, patrons generally travel a reasonable distance to attend, with a high proportion of car-pooling.

Figure 11 illustrates the proposed layout of the site. The drawing is part of the DA package and further assessment of the site plan should be undertaken using the DA drawings.

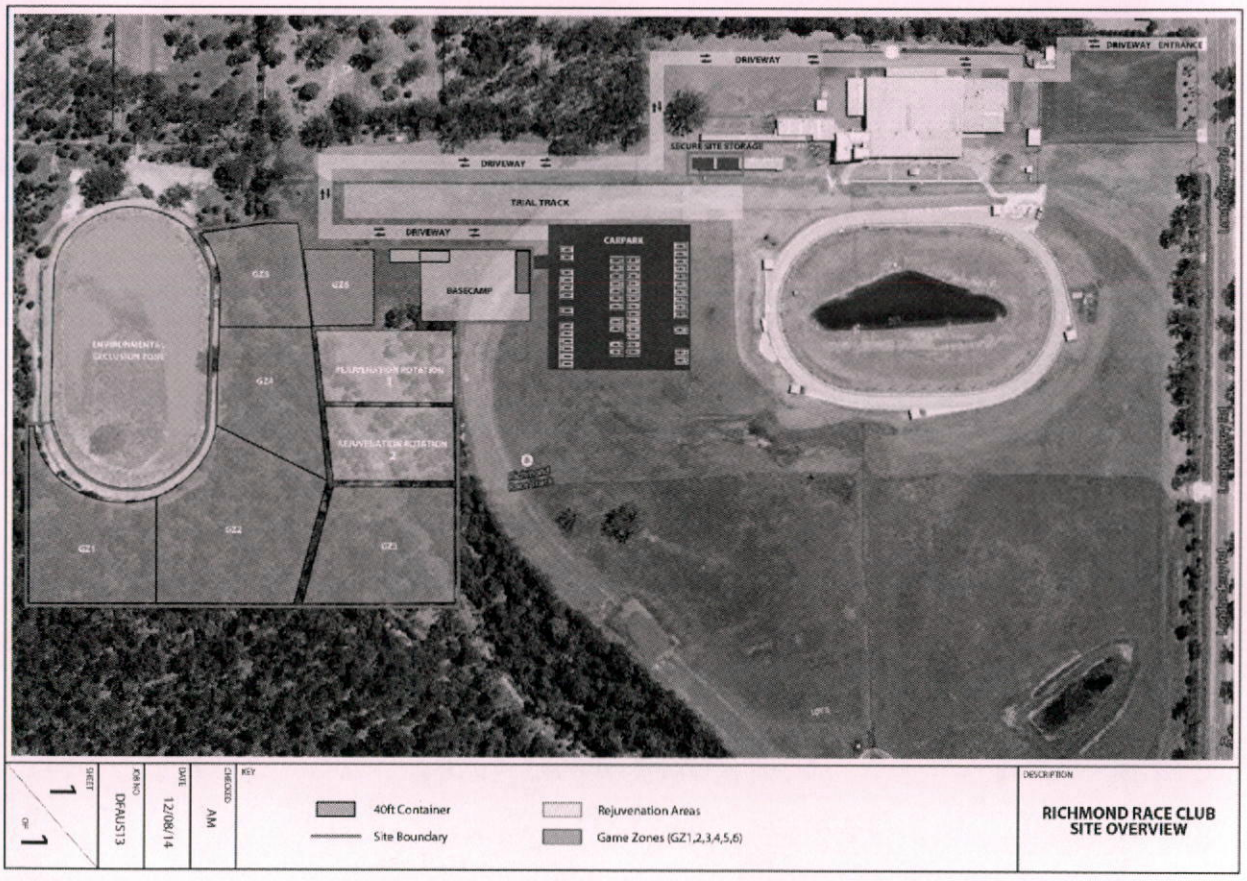

Figure 11: Proposed Location of Game Fields

For the proposal:

- Staffing numbers would vary according to the number of players booked for a session. 7 staff are required for 60 players.
- The number of players per game could vary from as low as 20 and as many as 40.
- A maximum of 6 game fields is envisaged.
- The expected daily attendance is 100 persons with a maximum of 150 persons per day
- The operating times would be between 9am and 4pm, 7 days
- Given that the games would be played mostly by adults only (18 years and older), the majority of activity would be expected to occur on weekends.
- The first players would arrive at 8.30am and the last players would leave at 4pm.
- The traffic generational profile would be "highly peaked", with a significant majority arriving between 8.30am & 9.30am on the weekend, and a significant majority departing between 3pm & 4pm. The nature of the activity and the location of such facilities lend themselves to all-day bookings.
- Car park attendants would supervise the car park on arrival and departure.
- A dedicated car park of 50 car spaces will be available for the Paintball customers and staff
    - Paintball customers will be also be able to use the existing car park of the Richmond Greyhound Racing Club that is also used by greyhound race attendees

4. CAR PARKING CONSIDERATIONS

4.1 Parking Requirement Assessment

Car parking requirements for various land uses are generally contained in the NSW RTA Guide to Traffic Generating Development V2.0 and/or Penrith City Council's Development Control Plan (DCP). However, the parking requirements for the proposed paintball recreational/sporting facility use are not defined in these documents.

In view of this, a "first principles" analysis was conducted, based on a survey of car-parking accumulation, vehicle occupancy and traffic generation associated with a similar facility, Action Paintball Games, located at the corner of Edwards Road & Annangrove Roads, Rouse Hill. This facility is larger – with 18 game fields on approximately 22 hectares. A telephone survey was conducted to determine the busiest day of the week to enable data on maximum parking & traffic generation to be collected.

Table 2 presents details of the parking accumulation and traffic generation (inbound & outbound movements) survey as carried out for the previous Development Application. The on-site car park was found to have a capacity of approximately 110 vehicles. Vacant land across the road was used as an overflow parking area.

TIME PERIOD	VEHICLE MOVEMENT		PARKING ACCUMULATION
	IN	OUT	
7:00 - 8:00	26	1	25
8:00 - 9:00	60	3	82
9:00 - 10:00	39	5	116
10:00 - 11:00	12	2	126
11:00 - 12:00	20	11	135
12:00 - 13:00	12	4	143
13:00 - 14:00	43	31	155
14:00 - 15:00	9	51	113
15:00 - 16:00	14	78	49
16:00 - 17:00	1	45	5
Ξ	236	231	

Table 2: Parking Accumulation & Traffic Generation – Action Paintball Games, Rouse Hill

Table 3 presents details of vehicle occupancies between 8am and 11am.

TIME PERIOD	NO OF CARS	VEHICLE OCCUPANCY						TOTAL OCCUPANCY	AVERAGE OCCUPANCY
		1	2	3	4	5	6+		
8:00 - 8:15	10	4	4	0	2	0	0	20	2.00
8:15 - 8:30	19	5	8	4	2	0	0	41	2.16
8:30 - 8:45	13	8	2	0	1	1	1	27	2.08
8:45 - 9:00	19	6	7	3	0	2	1	45	2.37
9:00 - 9:15	17	8	2	6	1	0	0	34	2.00
9:15 - 9:30	6	3	2	0	0	1	0	12	2.00
9:30 - 9:45	9	4	2	1	1	1	0	20	2.22
9:45 - 10:00	7	2	3	2	0	0	0	14	2.00
10:00 - 10:15	6	0	4	1	1	0	0	15	2.50
10:15 - 10:30	0	0	0	0	0	0	0	0	-
10:30 - 10:45	2	2	0	0	0	0	0	2	1.00
10:45 - 11:00	4	0	3	1	0	0	0	9	2.25
¬	112	42	37	18	8	5	2	239	2.13
¬	100%	38%	33%	16%	7%	4%	2%		

Table 3: Vehicle Occupancy – Action Paintball Games, Rouse Hill

The surveys indicate:

- An average vehicle occupancy rate of 2.1.
- Over 80% of patrons car-pooled.
- Approximately 450 patrons for the day, based on the total number of arrivals between 7am and 5pm, and the vehicle occupancy rate applied over the majority of the day.
- An average of 25 patrons for each game field.
- Saturday being the busiest day for paintball recreation.
- A traffic generation rate of between 60 & 70 vehicles per hour between 7.30am & 9.30am (mostly arrivals) and between 2.30pm & 4.30pm (mostly departures)
- A peak weekend traffic generation of 460 vehicles per day.

Based on the findings of the survey:

- A maximum patronage rate of around 150 would apply for the proposed 6-field facility at the Richmond Race Club site on Saturday, the busiest day of the work for the proposed use.
- A lower patronage rate for Sunday (not specifically quantified, but assumed to be a maximum of 128 or 85%).
- A parking requirement of around 55 spaces would apply on Saturday and 45 spaces for Sunday.
- A traffic generation rate of between 25 & 30 vehicles per hour between 7.30am & 9.30am and between 2.30pm & 4.30pm on a Saturday or a Sunday.
- The weekday PM hour will generate about 25 cars comprising staff and customer departures.
- The weekday AM peak hour is staff arrivals with an estimated 5 staff arriving in the weekday AM peak hour
- A peak weekend traffic generation of around 150 vehicles per day.

4.2 Adequacy of Proposed Car Parking Provision

As discussed previously, the paintball facility will have a dedicated carpark of 50 car spaces. Any additional car parking demand can be met in the Richmond Greyhound Racing Club that is also used by greyhound race attendees.

Surveys undertaken within the subject site on a Sunday morning indicate that there is sufficient availability of on-site vacant spaces to cater for additional parking associated with the paintball activity occurring concurrently with greyhound *trialing* (see Section 2.3).

A minimum of 100 to 120 long-term spaces were available to staff & patrons within the on-site parking area at 9am on Sunday. By mid-day, around 150 to 170 spaces were available, given that the *trialing* activity was over by that time. The maximum parking demand of 45 spaces on a Sunday can be readily accommodated on-site.

A minimum of 150 to 170 spaces were available within the on-site parking area on Saturday. The maximum parking demand of 55 spaces on a Saturday can be readily accommodated on-site.

A parking survey on a *race* day (Monday) was not conducted as the proposed paintball recreational/sporting facility is not likely to be busy.

The proposal for an outdoor paintball recreational/sporting facility use at the subject site with the proposed on-site car-parking provision is appropriate.

5. TRAFFIC IMPACT

The majority of traffic associated with the proposed paintball facility would be generated between 7.30am & 9.30am and between 2.30pm & 4.30pm. The addition of 25 to 30 vehicles per hour during the peak arrival & departure periods and around 200 vehicles for the whole day (Saturday) will not adversely affect the operation of Londonderry Road.

The following Figures present the existing with the paintball traffic with origin trips in red and destination trips in blue.

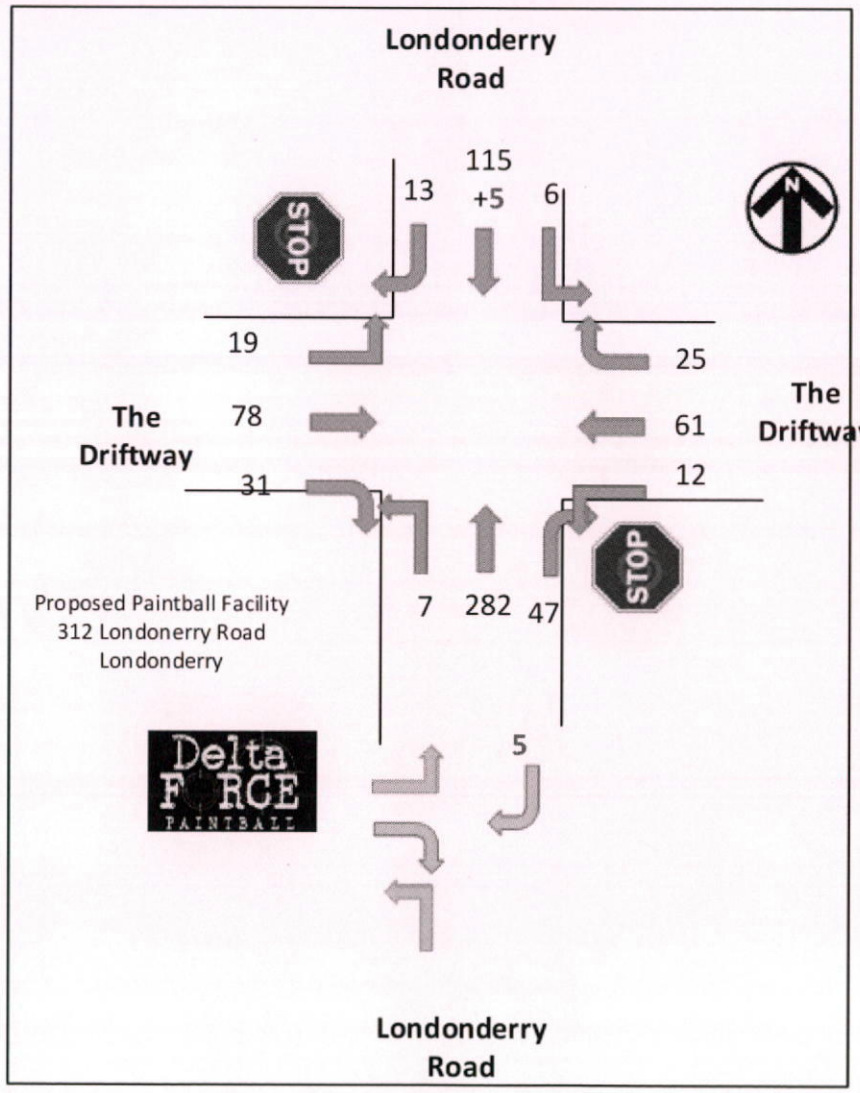

Figure 12: Existing Weekday AM Peak Hour Traffic Volumes with Paintball Traffic

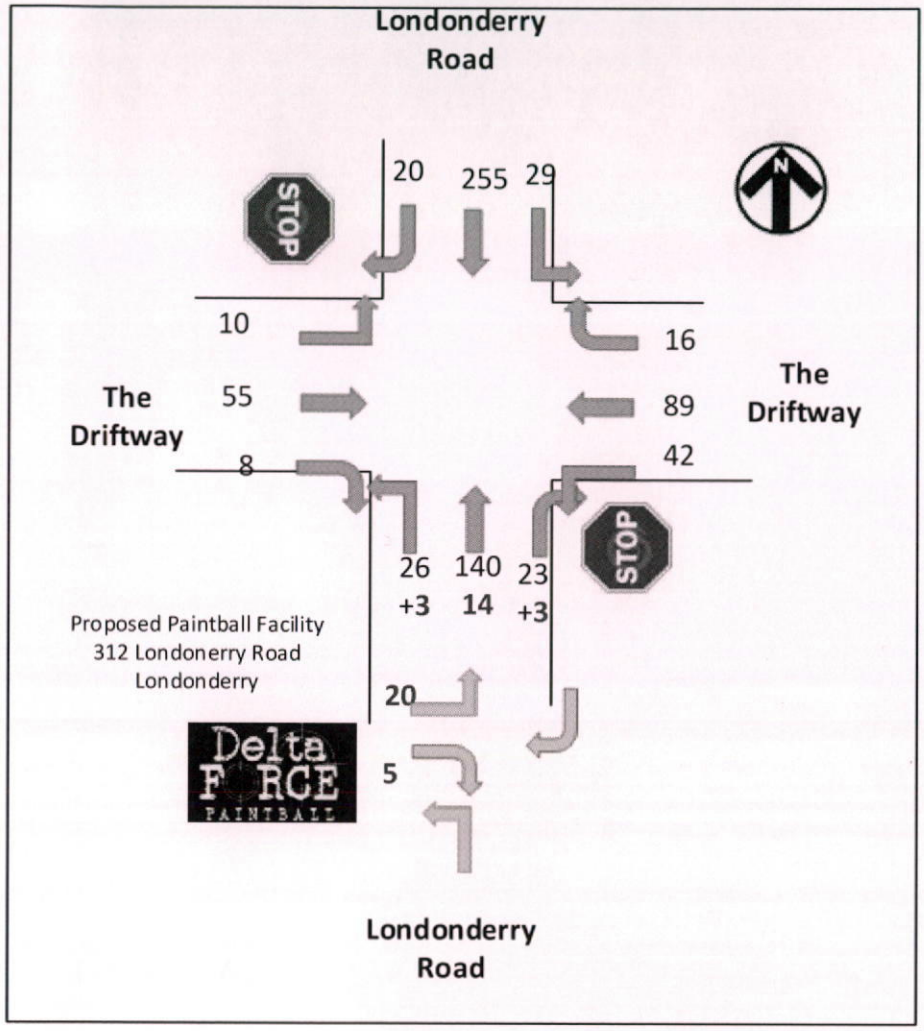

Figure 13: Existing Weekday PM Peak Hour Traffic Volumes with Paintball Traffic

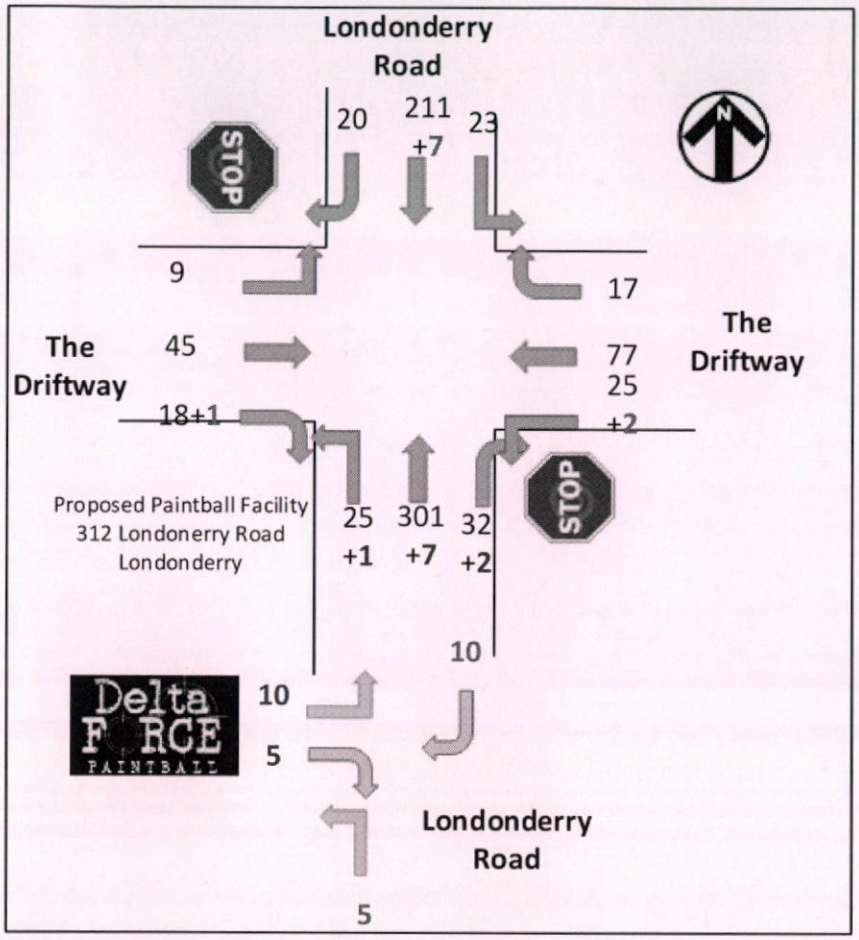

Figure 14: Existing Saturday Peak Hour Traffic Volumes with Paintball Traffic

5.1 Intersection Assessment with Additional Paintball Traffic Volumes

An intersection with the additional trips for the weekday AM and PM and Saturday peak hours has been undertaken. The results are summarised below:

Londonderry Road with The Driftway

- All turn movements have a LoS A or B for the three peak hours The additional trips does not change the LoS for any turn movement for either peak hour

The full SIDRA outputs are presented in Appendix B for the existing and development traffic conditions. The existing conditions are presented in Appendix A.

6. CONCLUSION

Based on the considerations presented in this report, it is considered that:

- The proposed paintball recreational/sporting facility would result in a parking demand of up to 72 spaces (based on a maximum of 150 players and a car-occupancy ratio of 2.1) on a Saturday and/or a Sunday, and considerably fewer spaces on weekdays.
- There is significant capacity (150 to 170 spaces or enough spaces for 300 to 350 patrons & staff) within the unsealed on-site car-park on the peak weekend day (Saturday), as there is no activity associated with the Richmond Race Club.
- There is generous capacity (100 to 120 spaces or enough spaces for 210 to 250 patrons & staff) within the unsealed on-site car-park on Sunday morning, when trialing activity occurs at the Richmond Race Club.
- The level of traffic generated as a result of this proposal is low – up to 30 vehicles per hour during peak arrival and departure periods, and 200 vehicles per day on a Saturday or a Sunday. The traffic impact will not adversely affect the operation of Londonderry Road.
- There are no traffic engineering or parking requirement reasons against the issue of a Planning Permit for the proposed paintball recreational/sporting facility at 312 Londonderry Road, Londonderry.

APPENDIX A

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Londonderry Road south											
1	L2	7	0.0	0.178	6.0	LOS A	1.1	7.5	0.26	0.09	56.6
2	T1	282	0.0	0.178	0.4	LOS A	1.1	7.5	0.26	0.09	58.1
3	R2	47	0.0	0.178	5.9	LOS A	1.1	7.5	0.26	0.09	56.0
Approach		336	0.0	0.178	1.3	NA	1.1	7.5	0.26	0.09	57.8
East: The Driftway east											
4	L2	12	0.0	0.144	11.1	LOS A	0.5	3.6	0.43	0.98	50.4
5	T1	61	0.0	0.144	10.8	LOS A	0.5	3.6	0.43	0.98	50.2
6	R2	25	0.0	0.144	10.6	LOS A	0.5	3.6	0.43	0.98	50.0
Approach		98	0.0	0.144	10.8	LOS A	0.5	3.6	0.43	0.98	50.1
North: Londonderry Road north											
7	L2	6	0.0	0.072	6.5	LOS A	0.4	3.1	0.38	0.08	56.2
8	T1	115	0.0	0.072	1.0	LOS A	0.4	3.1	0.38	0.08	57.7
9	R2	13	0.0	0.072	6.4	LOS A	0.4	3.1	0.38	0.08	55.6
Approach		134	0.0	0.072	1.8	NA	0.4	3.1	0.38	0.08	57.4
West: The Driftway west											
10	L2	19	0.0	0.186	11.2	LOS A	0.7	4.8	0.50	0.99	50.5
11	T1	78	0.0	0.186	10.9	LOS A	0.7	4.8	0.50	0.99	50.2
12	R2	31	0.0	0.186	10.6	LOS A	0.7	4.8	0.50	0.99	50.0
Approach		128	0.0	0.186	10.9	LOS A	0.7	4.8	0.50	0.99	50.2
All Vehicles		696	0.0	0.186	4.5	NA	1.1	7.5	0.35	0.38	55.0

Table A1: Intersection Performance of Londonderry Road with The Driftway Weekday AM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Londonderry Road south											
1	L2	26	0.0	0.103	6.6	LOS A	0.6	4.4	0.39	0.13	55.6
2	T1	140	0.0	0.103	1.0	LOS A	0.6	4.4	0.39	0.13	57.1
3	R2	23	0.0	0.103	6.5	LOS A	0.6	4.4	0.39	0.13	55.0
Approach		189	0.0	0.103	2.4	NA	0.6	4.4	0.39	0.13	56.6
East: The Driftway east											
4	L2	42	0.0	0.194	10.8	LOS A	0.7	5.2	0.47	0.97	50.7
5	T1	89	0.0	0.194	10.4	LOS A	0.7	5.2	0.47	0.97	50.4
6	R2	16	0.0	0.194	10.2	LOS A	0.7	5.2	0.47	0.97	50.2
Approach		147	0.0	0.194	10.5	LOS A	0.7	5.2	0.47	0.97	50.5
North: Londonderry Road north											
7	L2	29	0.0	0.160	6.1	LOS A	1.0	6.9	0.30	0.08	56.4
8	T1	255	0.0	0.160	0.6	LOS A	1.0	6.9	0.30	0.08	57.9
9	R2	20	0.0	0.160	6.0	LOS A	1.0	6.9	0.30	0.08	55.8
Approach		304	0.0	0.160	1.5	NA	1.0	6.9	0.30	0.08	57.6
West: The Driftway west											
10	L2	10	0.0	0.102	10.9	LOS A	0.4	2.6	0.43	0.97	50.6
11	T1	55	0.0	0.102	10.5	LOS A	0.4	2.6	0.43	0.97	50.4
12	R2	8	0.0	0.102	10.3	LOS A	0.4	2.6	0.43	0.97	50.1
Approach		73	0.0	0.102	10.5	LOS A	0.4	2.6	0.43	0.97	50.4
All Vehicles		713	0.0	0.194	4.5	NA	1.0	6.9	0.37	0.37	54.9

Table A2: Intersection Performance of Londonderry Road with The Driftway Weekday PM Peak Hour Existing Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Londonderry Road south											
1	L2	25	0.0	0.191	6.5	LOS A	1.3	8.8	0.38	0.08	56.1
2	T1	301	0.0	0.191	0.9	LOS A	1.3	8.8	0.38	0.08	57.6
3	R2	32	0.0	0.191	6.4	LOS A	1.3	8.8	0.38	0.08	55.5
Approach		358	0.0	0.191	1.8	NA	1.3	8.8	0.38	0.08	57.3
East: The Driftway east											
4	L2	25	0.0	0.187	11.9	LOS A	0.7	4.8	0.50	0.99	50.0
5	T1	77	0.0	0.187	11.5	LOS A	0.7	4.8	0.50	0.99	49.7
6	R2	17	0.0	0.187	11.3	LOS A	0.7	4.8	0.50	0.99	49.5
Approach		119	0.0	0.187	11.6	LOS A	0.7	4.8	0.50	0.99	49.8
North: Londonderry Road north											
7	L2	23	0.0	0.136	6.8	LOS A	0.9	6.4	0.44	0.08	55.8
8	T1	211	0.0	0.136	1.3	LOS A	0.9	6.4	0.44	0.08	57.3
9	R2	20	0.0	0.136	6.7	LOS A	0.9	6.4	0.44	0.08	55.3
Approach		254	0.0	0.136	2.2	NA	0.9	6.4	0.44	0.08	57.0
West: The Driftway west											
10	L2	9	0.0	0.125	12.3	LOS A	0.4	3.1	0.54	1.00	49.8
11	T1	45	0.0	0.125	11.9	LOS A	0.4	3.1	0.54	1.00	49.5
12	R2	18	0.0	0.125	11.7	LOS A	0.4	3.1	0.54	1.00	49.3
Approach		72	0.0	0.125	11.9	LOS A	0.4	3.1	0.54	1.00	49.5
All Vehicles		803	0.0	0.191	4.3	NA	1.3	8.8	0.43	0.30	55.2

Table A3: Intersection Performance of Londonderry Road with The Driftway Saturday Peak Hour Existing Conditions

APPENDIX B

SIDRA Intersection Results for Existing Traffic Conditions

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Londonderry Road south											
1	L2	7	0.0	0.179	6.0	LOS A	1.1	7.5	0.26	0.09	56.5
2	T1	282	0.0	0.179	0.4	LOS A	1.1	7.5	0.26	0.09	56.1
3	R2	47	0.0	0.179	5.9	LOS A	1.1	7.5	0.26	0.09	55.9
Approach		336	0.0	0.179	1.3	NA	1.1	7.5	0.26	0.09	57.7
East: The Driftway east											
4	L2	12	0.0	0.145	11.2	LOS A	0.5	3.7	0.44	0.98	50.4
5	T1	61	0.0	0.145	10.8	LOS A	0.5	3.7	0.44	0.98	50.1
6	R2	25	0.0	0.145	10.6	LOS A	0.5	3.7	0.44	0.98	49.9
Approach		98	0.0	0.145	10.8	LOS A	0.5	3.7	0.44	0.98	50.1
North: Londonderry Road north											
7	L2	6	0.0	0.075	6.5	LOS A	0.5	3.2	0.39	0.07	56.2
8	T1	120	0.0	0.075	1.0	LOS A	0.5	3.2	0.39	0.07	57.7
9	R2	13	0.0	0.075	6.4	LOS A	0.5	3.2	0.39	0.07	55.6
Approach		139	0.0	0.075	1.7	NA	0.5	3.2	0.39	0.07	57.4
West: The Driftway west											
10	L2	19	0.0	0.187	11.3	LOS A	0.7	4.9	0.50	0.99	50.4
11	T1	78	0.0	0.187	10.9	LOS A	0.7	4.9	0.50	0.99	50.2
12	R2	31	0.0	0.187	10.7	LOS A	0.7	4.9	0.50	0.99	50.0
Approach		128	0.0	0.187	10.9	LOS A	0.7	4.9	0.50	0.99	50.2
All Vehicles		701	0.0	0.187	4.5	NA	1.1	7.5	0.36	0.38	55.0

Table B1: Intersection Performance of Londonderry Road with The Driftway Weekday AM Peak Hour Existing Conditions with Paintball Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Londonderry Road south											
1	L2	29	0.0	0.114	6.6	LOS A	0.7	5.0	0.40	0.13	55.6
2	T1	154	0.0	0.114	1.0	LOS A	0.7	5.0	0.40	0.13	57.1
3	R2	26	0.0	0.114	6.5	LOS A	0.7	5.0	0.40	0.13	55.0
Approach		209	0.0	0.114	2.5	NA	0.7	5.0	0.40	0.13	56.6
East: The Driftway east											
4	L2	42	0.0	0.197	10.9	LOS A	0.8	5.3	0.48	0.98	50.6
5	T1	89	0.0	0.197	10.6	LOS A	0.8	5.3	0.48	0.98	50.3
6	R2	16	0.0	0.197	10.4	LOS A	0.8	5.3	0.48	0.98	50.1
Approach		147	0.0	0.197	10.7	LOS A	0.8	5.3	0.48	0.98	50.4
North: Londonderry Road north											
7	L2	29	0.0	0.160	6.2	LOS A	1.0	7.0	0.32	0.08	56.3
8	T1	255	0.0	0.160	0.7	LOS A	1.0	7.0	0.32	0.08	57.8
9	R2	20	0.0	0.160	6.1	LOS A	1.0	7.0	0.32	0.08	55.7
Approach		304	0.0	0.160	1.5	NA	1.0	7.0	0.32	0.08	57.5
West: The Driftway west											
10	L2	10	0.0	0.105	11.0	LOS A	0.4	2.6	0.45	0.97	50.5
11	T1	55	0.0	0.105	10.7	LOS A	0.4	2.6	0.45	0.97	50.3
12	R2	8	0.0	0.105	10.4	LOS A	0.4	2.6	0.45	0.97	50.1
Approach		73	0.0	0.105	10.7	LOS A	0.4	2.6	0.45	0.97	50.3
All Vehicles		733	0.0	0.197	4.6	NA	1.0	7.0	0.39	0.36	54.9

Table B2: Intersection Performance of Londonderry Road with The Driftway Weekday PM Peak Hour Existing Conditions with Paintball Traffic

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Londonderry Road south											
1	L2	26	0.0	0.196	6.5	LOS A	1.3	9.1	0.39	0.08	56.0
2	T1	308	0.0	0.196	1.0	LOS A	1.3	9.1	0.39	0.08	57.5
3	R2	34	0.0	0.196	6.4	LOS A	1.3	9.1	0.39	0.08	55.5
Approach		368	0.0	0.196	1.9	NA	1.3	9.1	0.39	0.08	57.2
East: The Driftway east											
4	L2	27	0.0	0.193	12.0	LOS A	0.7	5.0	0.50	0.99	49.9
5	T1	77	0.0	0.193	11.6	LOS A	0.7	5.0	0.50	0.99	49.7
6	R2	17	0.0	0.193	11.4	LOS A	0.7	5.0	0.50	0.99	49.5
Approach		121	0.0	0.193	11.7	LOS A	0.7	5.0	0.50	0.99	49.7
North: Londonderry Road north											
7	L2	23	0.0	0.140	6.9	LOS A	0.9	6.6	0.44	0.08	55.8
8	T1	218	0.0	0.140	1.3	LOS A	0.9	6.6	0.44	0.08	57.3
9	R2	20	0.0	0.140	6.8	LOS A	0.9	6.6	0.44	0.08	55.3
Approach		261	0.0	0.140	2.2	NA	0.9	6.6	0.44	0.08	57.0
West: The Driftway west											
10	L2	9	0.0	0.130	12.5	LOS A	0.5	3.2	0.54	1.00	49.7
11	T1	45	0.0	0.130	12.2	LOS A	0.5	3.2	0.54	1.00	49.4
12	R2	19	0.0	0.130	11.9	LOS A	0.5	3.2	0.54	1.00	49.2
Approach		73	0.0	0.130	12.1	LOS A	0.5	3.2	0.54	1.00	49.4
All Vehicles		823	0.0	0.196	4.3	NA	1.3	9.1	0.44	0.30	55.2

Table B3: Intersection Performance of Londonderry Road with The Driftway Saturday Peak Hour Existing Conditions with Paintball Traffic

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ENVIRONMENTAL NOISE IMPACT
PROPOSED PAINTBALL GAME SITE
AT LONDONDERRY, NSW

REPORT NUMBER: 3451

PREPARED FOR: Delta Force Properties
51 Fletcher St
Woollahra NSW 2025

Attention: Mr Adam Kirwan-Taylor
Telephone: 9389 7951

DATE ISSUED: 15 December 2005

Report Status	Prepared by: David Luck	Approved by: Athol Day
Final	D. Luck	Athol Day

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TABLE OF CONTENTS

1.0 CONSULTING BRIEF

Day Design Pty Ltd was engaged by Delta Force Properties to investigate the environmental noise impact of a proposed Paintball Game Site on a wooded area adjacent to the Richmond Racecourse on Londonderry Rd, Londonderry. This commission involves the following:

Scope of Work:

- Inspect the site and environs.
- Measure the background noise levels at critical locations and times.
- Establish acceptable noise level criterion.
- Quantify noise emissions from the Proposed Paintball operation.
- Calculate noise emission, considering ground absorption, screen walls and distance.
- Prepare a site plan identifying the development and nearby noise sensitive locations.
- Provide recommendations for noise control if necessary.
- Prepare an Environmental Noise Impact Report.

2.0 PROJECT DESCRIPTION & SUMMARY OF FINDINGS

The proposed Paintball Game Site is located in a forested area adjacent to the Richmond Racecourse as shown on the attached Site Plan 3451 Figure 1. The proposed area occupies approximately half of a 161 ha lease area to the west and south west of the Richmond Racecourse. The nearest residences are located to the north on The Driftway. The houses on the residential properties are approximately 250 m from the proposed development. To the west is an existing Greyhound Training facility, while to the east is the main Richmond Race Track. A Car Park accessed via Londonderry Rd will be located behind the Race Course.

Upon arrival patrons will be directed to the Base Camp, where they will be provided with protective equipment, paintball gun and paintballs. Once equipped, the players will be escorted to Practice Firing Range where they are instructed on the correct use of the Paintball Gun, and than directed to one of six playing fields located inside a bushland corridor between the Racecourse and the Greyhound Training facility. There is a 1.8 metre high Colorbond fence on the rear boundary of the residential premises as shown in Figure 1, which will provide useful visual and acoustic screening of the Paintball Game activities.

Approximately 500 players are estimated to visit the site each week, with a maximum capacity of 60 players although not all players will be active at one time. Noise emission times will be restricted to the daytime hours of 9 am until 6 pm Monday to Saturday and 10 am to 5 pm on Sundays.

The noise emission from the proposed Paintball Range has been modelled on computer and it has been determined to meet the noise requirements of the Council and the Environment Protection Authority without further noise control.

3.0 NOISE SURVEY INSTRUMENTATION

Noise level measurements and analysis were made with instrumentation as follows in Table 3.1:

Table 3.1 Noise Instrumentation

Description	Model No.	Serial No.
Infobyte Noise Logger	iM3	32
Condenser Microphone 0.5" diameter	MK 250	2622
Microphone Windscreen	Acoustically transparent foam	

The **CEL 593 Sound Analyser** is a real-time precision integrating sound level meter with octave and third octave filters, that samples noise at a rate of 10 samples per second. The CEL 593 provides L_{eq}, L_1, L_{10}, L_{50} and L_{90} statistical data at 15-minute intervals (longer or shorter intervals optional) over the desired monitoring period. Results are normally downloaded to computer for rapid processing.

All instrument systems had been laboratory calibrated using instrumentation traceable to Australian National Standards and certified within the last two years thus conforming to Australian Standards. The measurement system was also field calibrated prior to and after noise surveys. Calibration drift was found to be less than 0.3 dB during attended measurements and within 1 dB for long-term measurements. No adjustments for instrument drift during the measurement period were warranted.

4.0 MEASURED AMBIENT NOISE LEVELS

In order to assess the severity of a possible environmental noise problem in a residential area it is necessary to measure the ambient background noise level at the times and locations of worst possible annoyance. The lower the background noise level, the more perceptible the intrusive noise becomes and the more potentially annoying.

The ambient L_{90} background noise level is a statistical measure of the sound pressure level that is exceeded for 90% of the measuring period (typically 15 minutes).

The Rating Background Level (RBL) is defined by the NSW EPA as the median value of the (lower) tenth percentile of L_{90} ambient background noise levels for day, evening or night periods, measured over 7 days during the proposed days and times of operation.

The places of worst possible annoyance are houses located along The Driftway. These residences are shown on the attached Site Plan 3451 Figure 1 and Figure 28960. The times of worst possible annoyance will be from 9 am to 5 pm when paintball activity occurs.

Ambient L_{90} background noise levels were measured at a location near the area identified on Figure 1 as the Practice Firing Range over seven (7) days from 18/10/2005 to 25/10/2005. These levels are presented in the attached Figure 2 and also in Table 4.1 below.

Table 4.1 Rating Background Level

Noise Measurement Location	Time Period	Rating Background Level
Near the rear residential boundary behind Richmond Race Course, Londonderry	Day (7 am to 6 pm)	**37 dBA**
	Evening (6 pm to 10 pm)	**38 dBA**
	Night (10 pm to 7 am)	**30 dBA**

Atmospheric conditions were ideal for noise monitoring. Noise measurements were therefore considered reliable and typical for the receptor area.

The Rating Background Level in daytime when the Paintball Game will be played is **37 dBA**.

5.0 ACCEPTABLE NOISE LEVELS

5.1 NSW Industrial Noise Policy

The NSW Environment Protection Authority (now incorporated into the Department of Environment and Conservation (NSW)) published the NSW Industrial Noise Policy in January 2000. The policy is specifically aimed at assessing noise from industrial noise sources scheduled under the Protection of the Environment Operations Act 1997.

Richmond Paintball is not a 'scheduled premises' under the Protection of the Environment Operations Act 1997 as Richmond Paintball is not required to hold a licence under that Act for operations at the site.

The appropriate regulatory authority (EPA or Council) may, by notice in writing given to such a person, prohibit the person from causing, permitting or allowing:

any specified activity to be carried on at the premises, or

(a) any specified article to be used or operated at the premises,

or both, in such a manner as to cause the emission from the premises, at all times or on specified days, or between specified times on all days or on specified days, of noise that, when measured at any specified point (whether within or outside the premises,) is in excess of a specified level.

It is an offence to contravene a noise control notice. Prior to being issued with a noise control notice, no offence has been committed.

The Industrial Noise Policy provides a useful framework to assess noise emission from non-scheduled premises, whether that premises produces offensive or non-offensive noise.

The Protection of the Environment Operations Act 1997 defines "Offensive Noise" as noise:

(a) that, by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances:

(i) is harmful to (or is likely to be harmful to) a person who is outside the premises from which it is emitted, or

(ii) interferes unreasonably with (or is likely to interfere unreasonably with) the comfort or repose of a person who is outside the premises from which it is emitted, or

(b) that is of a level, nature, character or quality prescribed by the regulations or that is made at a time, or in other circumstances prescribed by the regulation.

While the Industrial Noise Policy is not strictly applicable to this site, as the site is not scheduled, in the absence of other relevant standards the limits set out in the NSW Industrial Noise Policy will be used as a guide in determining whether the level of noise is considered offensive or not.

5.2 Residential Receptor Noise Intrusiveness Criteria

The EPA states in Section 2.1 of its NSW Industrial Noise Policy (January 2000) that the L_{eq} level of noise intrusion from broad-band industrial noise sources may be up to 5 dBA above the L_{90} background noise level at the receptor without being considered offensive.

The Rating Background Level at Location A was 30 dBA at night, 38 dBA in the evening and 37 dBA during the daytime. Therefore the acceptable L_{eq} noise intrusiveness criteria for **broadband noise** in this area is (30 + 5 =) 35 dBA at night, (38 + 5 =) 43 dBA in the evening and (37 + 5 =) 42 dBA during the day.

Where a noise source contains certain characteristics, such as tonality, impulsiveness, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same noise level. Correction factors may be applied to the noise annoyance criteria to determine the project specific criteria.

In our opinion, the character of noise from paintball guns is slightly impulsive, but should not incur a 5 dBA penalty for impulsiveness. At a distance, the noise from paintball guns is characterised by gentle compressed-air "pops" rather than loud explosive bullet "bangs". At the Helensburgh Paintball Game Site, noise from multiple bursts was more frequent than single shot activity. This was typically conducted by one or more persons during each game. The effects of multiple bursts was not observed to be subjectively impulsive in character. As shown in Table 6.1a measured noise levels during multiple bursts was louder by approximately 6 dBA. In our opinion a 2 dBA penalty is considered more appropriate to account for the occasional impulsive noise of single gun shots.

The Rating Background Level at Location was 37 dBA during the daytime. Therefore the acceptable L_{eq} noise intrusiveness criteria for **impulsive noise** in this area is (37 + 5 – 2 =) 40 dBA during the day.

5.3 Project Specific Noise Criteria

When all the above factors are considered the project specific criteria is as follows:

- **42 dBA for broadband noise sources such as that from the Carpark and 40 dBA for Paintball Gun noise sources during the day.**

These criteria is to be assessed at the most affected point on or within the residential property boundary – or, if that is more than 30 m from the residence, at the most-affected point within 30 m of the residence.

6.0 PAINTBALL NOISE EMISSION

The main sources of noise from these premises paintball game noise and car park activity which occurs daily each week.

6.1 Paintball Game Noise Emission

A noise survey was carried out at the Ultimate Paintball game site at Helensburgh to determine the character and level of noise generated by paintball activities. Sound pressure level readings were taken around a VM68 paintball gun at 45 degrees, 90 degrees and 135 degrees to the line of fire and at a distance of 3m. A schedule of average sound power levels for the equipment is given in Table 6.1a below. The Sound Exposure Level (SEL) represents the sound energy of a gunshot averaged over one second. It provides a very useful tool for calculating the L_{eq} (15 min) noise level at nearby residences.

Table 6.1a Paintball Gun SEL Sound Power Levels

Paintball Gun Model and Firing Mode	SEL Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
VM68 Single Shot	**96**	84	86	89	90	90	89	90	88
VM68 Multiple Burst	**103**	90	91	94	94	95	95	98	99

In addition to gunshot noise, a paintball game is characterised by noise from whistles being blown to commence a contest and shouting by participants. Typical sound power levels for each of these activities is summarised below in Table 6.1b. For a typical day, there may be two or three Game Zones in operation at any one time with up to 30 contestants playing at any one time with up to 25 % of the participants (or 8 persons) shouting.

Table 6.1b Associated Paintball Activities SEL Sound Power Levels

Description	SEL Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
Sports Whistle	**107**	-	-	-	-	77	106	97	89
8 persons shouting	**99**	71	82	91	97	95	92	82	65

Knowing the sound power level of a noise source (see above Table 6.1), the sound pressure level (as measured with a sound level meter) can be calculated at a remote location using suitable formulae to account for distance losses, ground absorption, sound barriers, atmospheric effects, etc.

We predict that the L_{eq} (15 min) level of noise for paintball activity will be not exceed 39 dBA within 30 metres of any nearby residence, as shown in Table 6.1c.

Table 6.1c Predicted L_{eq}, 15-minute noise levels Paintball Game Activity

Receptor Location	Acceptable Level	Predicted Level	Compliance
Residences along The Driftway	40 dBA	39 dBA	Yes

6.2 Carpark Noise Emission

For the purpose of assessing the maximum possible level of noise emission from the car parks, we have assumed a flow of cars equivalent to 40 cars in 30 minutes leaving through Londonderry Rd exit. The L_{eq} sound power level and spectrum of such car park noise was measured by Day Design at a previous location is given in Table 6.2 below:

Table 6.2 L_{eq} Levels of a Car park with 6 cars leaving in 15 minutes

Description	Sound Power Levels (dB) at Octave Band Centre Frequencies (Hz)								
	dBA	63	125	250	500	1k	2k	4k	8k
L_{eq} level of 1 car leaving the Carpark	71	78	72	68	66	67	63	58	52
L_{eq} level of 6 cars leaving Carpark at any one time.	79	86	80	76	74	75	71	66	60

The predicted L_{eq} (15 min) level of noise from the Carpark, when measured on any nearby residential premises at not more than 30 metres from the residence, is 40 dBA. This is less than the broadband noise criterion of 42 dBA and is therefore acceptable.

7.0 NOISE CONTROL RECOMMENDATIONS

While the predicted level of noise emission from the proposed development is predicted to comply with the acceptable noise criterion established in Section 5 of this report. We recommend that a number of best practice treatments be considered to minimise the impact of the operation.

7.1 Game Zone Materials

To reduce the noise of paintballs hitting surfaces used in the game zone areas, we recommend that resilient materials such as shade-cloth fabric, wood, or rubber be used in the construction of any Game Zone structures. If the use of galvanised steel or Colorbond is required, we recommend that shade cloth be suspended in front of these surfaces to absorb the impact of any paintballs that may be inadvertently directed at them.

7.2 Practice Firing Range

As shown in Site Plan Figure 1, the Practice Firing Range will be located at the North end of the Game Zones. There will be very little firing at this location, so this range will be used as a buffer zone to provide greater distance attenuation of noise from the more active Game Zones 1 to 6 shown on the Site Plan. We recommend that firing on the Practice Range be directed towards the South, away from the residential premises and into the bushland where it will be absorbed. The targets and surfaces inside Practice Firing Range these should be made of absorbent materials. The 1.8 metre high Colorbond fence on the residential boundary will provide very useful screening of noise for the residences to the North.

7.3 Noise Management

As well as the engineering noise controls recommended above, we also recommend administrative noise controls be adopted by management and be encouraged by the use of clear signs and warnings to employees and patrons.

7.4 Construction Disclaimer

Recommendations made in this report are intended to resolve acoustical problems only. We make no claim of expertise in other areas and draw your attention to the possibility that our recommendations may not meet the structural, fire, thermal or other aspects of building construction.

We encourage clients to check with us before using materials or equipment that are alternative to those specified in our Acoustical Report.

8.0 NOISE IMPACT STATEMENT

Measurements and computations show that, provided the recommendations in Section 7 of this report are implemented, the level of noise emitted by Richmond Racecourse Paintball Game Site will meet the Department of Environment and Conservation's and/or Council's acceptable noise level requirements as detailed in Section 5 of this report.

We are of the opinion that sound emitted from this development will not cause "offensive noise" as defined by the Protection of the Environment Operations Act 1997. We therefore recommend that development consent be granted.

D. Luck

David Luck, MEngSc (Noise and Vibration), MAAS

Consulting Acoustical Engineer
for and on behalf of Day Design Pty Ltd.

A.A.A.C. MEMBERSHIP
Day Design Pty Ltd is a member company of the Association of Australian Acoustical Consultants, and the work herein reported has been performed in accordance with the terms of membership.

Attachments:

- Figure 1 – Site Plan
- Figure 2 – Ambient Noise Survey Graph

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Project: Delta Force Properties - Proposed RICHMOND PAINTBALL GAME SITE

Scale: 1 : 7,500 approximately

Date: 7.11.2005
Drawn By: D.Luck

3451 FIGURE 1.

Report 3451
Figure 2

Ambient Noise Survey

Located at 115m from Rear Boundary Fence, Richmond Race Track, NSW