


Bushfire Assessment and Recommendations

Proposed Development
Residential Units (Seniors Living)
Lot 17 Section 3 DP 758972
4 Close Street
Thirlmere NSW 2572



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Foreword

The following report outlines a bushfire assessment & recommendations for statutory bushfire safety compliance for proposed Residential Unit development for Seniors Living, at 4 Close Street, Thirlmere NSW 2572.

The basis and content of the report seeks to;

- *Provide recommendations for bushfire safety compliance to address the aim and objectives of the NSW Rural Fire Service document 'Planning for Bushfire Protection', (2006).*
- *Provide recommendations as to the type of construction and design which should be used (as applicable, retrospectively or otherwise) for the construction of the new building and appropriate asset protection zoning.*

Under Section 100B of the *Rural Fires Act 1997* a bushfire assessment report must be prepared in accordance with *Section A 4.2 of 'Planning for Bushfire Protection, (2006)'*, and must consider relevant legislation.

Whilst every effort has been made by the Author of the following report to ensure the accuracy and relevance of bushfire risk & management for the subject site, it must be remembered the phenomena of an uncontrolled wildfire and associated emergency response activities largely remains un-predictable.

Notwithstanding the precautions adopted or referred to by this plan, it should always be remembered that bushfires burn under a wide range of conditions and an element of risk, no matter how small, will always remain.

Introduction

The following report has been commissioned by S & H Kadir Pty Ltd, herein '*the proponent*', to provide a bush fire assessment and recommendations for bushfire safety and design compliance for the proposed Residential Unit development, for Seniors Living, at 4 Close Street, Thirlmere NSW 2572, Wollondilly Shire Council Local Government Area, herein '*the subject property*', or '*the subject development*'.

This assessment considers the subject development site on the basis of;

- The subject development site and all surrounding land for at least 140m beyond (denoted as '*Study Area*' by this report - denoted attached maps).
- A site specific inspection undertaken on the 18/9/2018.
- The extent and location of the proposed residential units, associated infrastructure are based on DA drawings prepared by Devine Drafting & Design, Mount Annan (Drawing No. 2234-6 r.mcq, Sheet Nos. 1 – 14, Issue G, Dated 29/10/2018).
- Vegetation extent within the subject area has been derived from available aerial photo interpretation (API), Department of Lands online systems, and on a site visit (18/9/2018).
- Terrain (slope) considered by this assessment is based on Department of Lands online information, supplied site plans of the subject property and a site visit (18/9/2018).
- A desktop assessment using licensed or on-line spatial data resources available at the time of this report.

The subject development site has been identified as being bounded by bush fire prone land, hence NSW legislative requirements for new building or integrated land development on bush fire prone lands is applicable.

For the purposes of this assessment, the subject development is considered a 'Special Fire Protection Purpose' development (herewith '*SFPP*'). *Section 100B (6) (a)* of the *Rural Fires Act 1997* defines '*housing for older people*' as requiring special fire protection.

Section 91 of the *EP&A Act 1979* (in combination with the *Rural Fires Act 1997* requirements for a Section 100B Bush Fire Safety Authority) classes a SFPP development as 'integrated development'.

In this respect, the subject development is considered 'integrated development', and as such has been assessed against the requirements and principals (aim and objectives) as outlined in the NSW document '*Planning for Bushfire Protection 2006*'. Under this Act the bushfire assessment report must be prepared in accordance with Section A4.2 of '*Planning for Bushfire Protection, 2006*', and must consider relevant legislation. *Planning for Bushfire Protection 2006* states;

'The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, on-site amenity and protection of the environment.

More specifically, the objectives are to:

- (i) afford occupants of any building adequate protection from exposure to a bush fire;*
- (ii) provide for a defensible space to be located around buildings;*
- (iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;*
- (iv) ensure that safe operational access and egress for emergency service personnel and residents is available;*
- (v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ);*
- (vi) ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting);*
- (vii) provide for the special characteristics and needs of occupants (SFPP Development); &*
- (viii) provide for safe emergency evacuation procedures (SFPP Development).'*

With specific reference to seniors living developments and bushfire safety compliance, PBP also states;

'The nature of seniors living developments determines that a relatively less mobile residential population is present and, as such, creates difficulties when evacuation is required. These residents cannot generally be expected to defend the property from bush fire attack'.

This assessment includes an analysis of the potential hazard persisting and affecting the subject development site and the standards and bush fire mitigation measures that should be introduced to address the objectives of PBP 2006 and AS 3959-2009 where applicable.

Bushfire safety compliance, as purported by this report, for the subject development site comprises a package of *measures in combination* including asset protection zones, access and egress, construction standards, water supply, property maintenance planning and evacuation planning.

The above measures have been derived from provisions (performance criteria and / or acceptable solutions) as outlined within the document '*Planning for Bushfire Protection 2006 (PBP)*', engineered judgment and previous advice or determinations from the NSW Rural Fire Service Development Control Unit.

The following bushfire assessment has been prepared **in accordance with** the *NSW Rural Fires Regulation 2008, Clause 44 - Application for a Bushfire Safety Authority*.

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1.0 Description of the property

1.1 Lot and deposited plan (DP) number of the subject property

Lot: 17 Section: 3 DP: 758972

1.2 Street address and locality map

4 Close Street, Thirlmere NSW 2572.

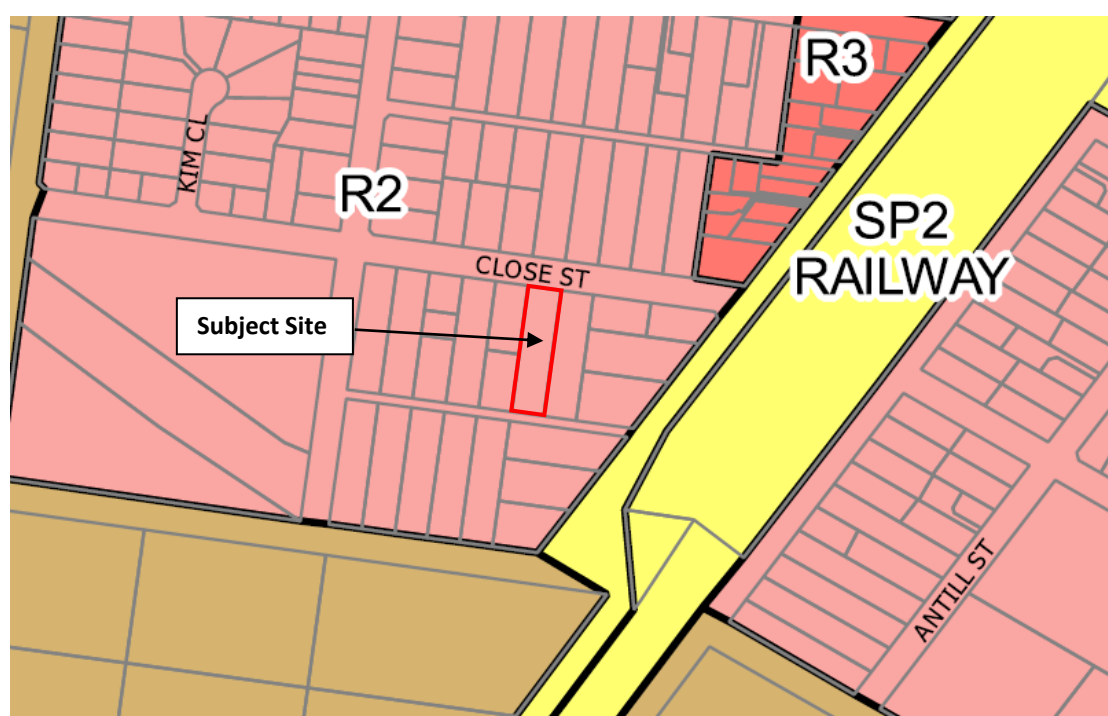
Locality maps attached Appendix 1.

1.3 Zoning of the subject land and any adjoining lands

The subject site is zoned 'R2 – Low Density Residential' under the Wollondilly LEP (2011).

All adjacent sites are also zoned 'R2 – Low Density Residential'.

The site adjoins a road reserve (Close Street) along the Northern boundary and a local laneway, along the Southern boundary.



Extract Wollondilly LEP 2011

1.4 Staging issues, if relevant, and description of the whole proposal

1.4.1 Staging

Staging issues are not considered relevant to the subject development.

The development will be able to achieve the deemed to satisfy provisions of the relevant legislation.

For the purposes of bushfire safety compliance, the subject development will not rely on any temporary asset protection zones (APZ).

1.4.2 Proposal Description

As provided by the proponent at the time of this report, the following information is based on;

- The extent and location of the proposed residential units, associated infrastructure are based on DA drawings prepared by Devine Drafting & Design, Mount Annan (Drawing No. 2234-5 r.mcq, Sheet Nos. 1 – 14, Issue F, Dated 23/10/2018).

The proposed building development within the subject property includes;

- A residential Unit Development – specifically for Seniors Living
- 12 separate individual units, contained within 2 buildings, and constructed over 2 levels (with lift and stair access).
- A large hard stand car parking area and driveway (15 spaces), &
- All associated infrastructure.

The existing public roadway system (Close Street) will service the development. Direct access to the car parking area will be from the existing public road system along the Northern boundary (Close Street).

The subject development site is connected to the local power supply grid and reticulated water supply. Power supply lines within the study area are currently located above ground.

Fire fighting water supply for the subject development site will be provided from the existing reticulated supply within Close Street, with the water supply within the development to fully comply with AS2419.1-2015 and any specific BCA requirements, including the general fire safety provisions (e.g. internal hydrants, fire hose reels, extinguishers etc., but only as required by the BCA provisions).

1.5 Aerial or ground photographs of the subject land including contours and existing and proposed cadastre

Ground / site photography of the subject property are appended to this report (Appendix 2 – Site Photos, 18/9/2018).

Aerial photography (oblique / boundary overlay) is as appended to this report (Appendix 1).

Contours as shown / considered by this report are derived from the Department of Lands SIX Viewer Digital Elevation Model (DEM) data (10m Contour Interval) (Appendix 1).

Existing cadastral and property boundaries are as denoted attached maps (Appendix 1).

2.0 Classification of vegetation out to 140m from the development

2.1 Structural description consistent with the identification key in Keith D (2004) and PBP

Vegetation extent (bushfire hazard) within the study area is derived from aerial photo interpretation (API) and an inspection of the subject property on the 18/9/2018.

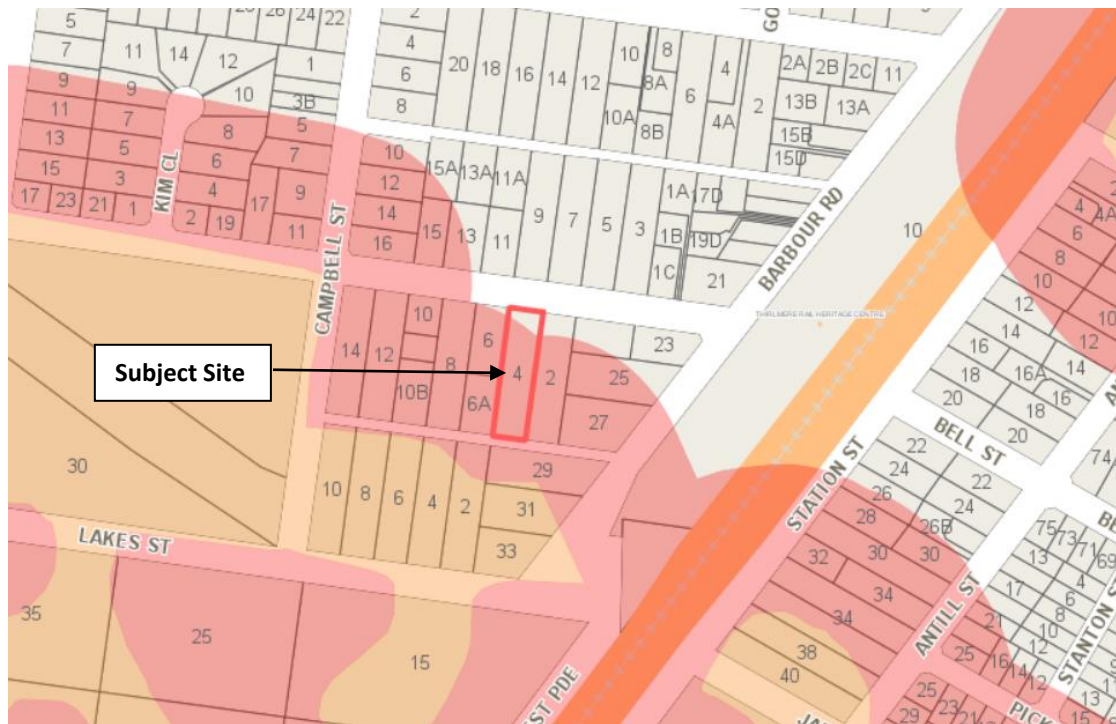
In general, all areas within the subject development site are considered 'cleared and managed lands'. The site is currently a large vacant / managed site (2031m²), clear of all vegetation.

Adjacent sites to the North, East & West contain local urban residential development (i.e. Thirlmere township), with the exception of 2 Close Street (adjoining to the East, which is a vacant residential site, with a few native trees. All adjacent areas to the North, East and West of the subject site are considered 'cleared and managed lands'

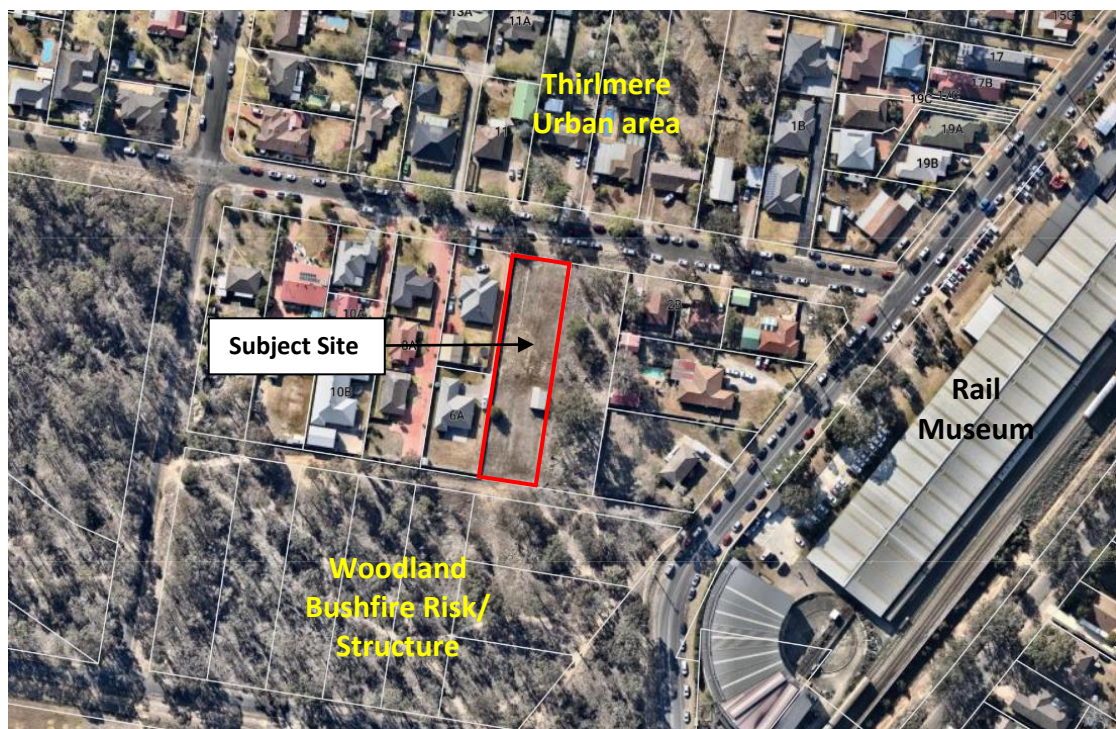
The bushfire risk is contained within adjacent residual residential lands, to the South of the subject site, beyond the laneway reserve. This vegetation is identified in local mapping as '*Shale Sandstone Transition Forest*'.

For the purposes of this assessment, the vegetation formation class (as per PBP 2006) affecting the subject property is considered, for the purpose of the bushfire hazard assessment (as per PBP 2006, to be '**Grassy Woodlands (Woodlands)**'.

This vegetation is classified as 'Category 1 Bushfire Vegetation' on local bushfire prone land mapping. The above is more accurately denoted Appendix 1 Map 3.



Extract Wollondilly BFPLM



Aerial – Subject Site and surrounds

2.2 Past disturbance factors and any future intended land uses that could alter the vegetation classification in the future

Considering the zoning of adjacent lands, it is reasonable to assume that the bushfire risk to the subject development will **not** increase any further over the life of the development.

3.0 Assessment of the effective slope to a distance of 100m

Slope analysis (used by this assessment) is derived from 10m grid digital elevation model (DEM) and a general inspection of the subject development site. This includes deriving contours for each 10m change in elevation and the approximate areas of slope / gradient based on PBP slope classes.

Considering the proximity of the subject development site to potentially persisting bushfire vegetation, the effective* slope potentially influencing the intensity of a bushfire has been assessed as:

- **SE – SW: Upslope / Flat**

** Average slope estimated over 100m (approx) between the proposed building development and potential bushfire vegetation (hazard) likely to persist & impact upon the subject property / development during an uncontrolled bushfire event.*

Considering the location of existing roadway access and maximum acceptable slope gradient (as defined in PBP, <15 Degrees for sealed roadway or <10 Degrees average grade), slope within or adjacent to the subject development site will not constrain the location of new or existing vehicle access roadways or the maintenance of proposed asset protection zones as otherwise recommended by this report.

4.0 Identification of any significant environmental features

For the purposes of bushfire safety compliance, this assessment notes that the subject property is considered 'cleared and managed lands'.

The proponent has not advised of any other constraint, restriction or burden over the subject property limiting the management of native vegetation for the purposes of land development and associated asset protection zone maintenance, apart from local planning legislation contained within or appended to the Wollondilly Shire Council LEP 2011 (i.e. any local tree preservation orders etc.).

Based on a brief desktop assessment of the subject property, the following table outlines significant environmental features potentially affected by the subject development.

Table 1.0

	<i>Present within Subject Property</i>	<i>Present within Study Area</i>	<i>Comment</i>
Native Forest / Vegetation	No	Yes	Native vegetation is located within the study area, external to the site. However, it is not proposed to remove any native vegetation as part of the proposed bushfire protection measures.
Riparian Corridor	No	No	
SEPP 14 – Wetland	No	No	
SEPP 26 – Littoral Rainforest	No	No	
SEPP 44 – Koala Habitat	No	No	
Areas of Geological Interest	Undetermined	Undetermined	
Environmental Protection Zones	No	No	
Steep Lands (>18°)	No	No	
Land Slip Area	No	No	
Flood Prone Area	No	No	
National Park Estate	No	No	
State Forest	No	No	

5.0 Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant

The vegetation constraining the proposed development is considered to be '*Shale Sandstone Transition Forest*'.

This community has been listed as 'Endangered Ecological Community' under the *NSW Threatened Species Conservation Act 1995*.

However, it is **not** proposed to remove any of this vegetation to comply with any planning provisions relating to bushfire protection measures.

No other known threatened species, populations or ecological communities identified under the *NSW Threatened Species Conservation Act 1995* have been noted, recorded or advised of as part of this assessment.

For the purposes of this assessment, the proponent has not provided nor indicated there to be any other threatened species issues or occurrence potentially affecting the subject land / development.

Likewise, this assessment has not considered any past studies, surveys for the area or any documentation supplied to council in relation to any threatened species issues or occurrence potentially affecting the subject land / development.

6.0 Details of Aboriginal heritage known to the applicant

No known Aboriginal heritage has been noted, recorded or advised of as part of this assessment. For the purposes of this assessment, the proponent has not provided nor indicated there to be any items or issues of Aboriginal heritage potentially affecting the subject development site.

Likewise, this assessment has not considered any past studies, surveys for the area or any documentation supplied to council in relation to any items or issues of Aboriginal heritage potentially affecting the subject development site.

7.0 Bush fire assessment (including methodology)

Methodology for this site assessment for bushfire attack and recommended mitigation measures (setback distances and construction standards) are based on PBP 2006 (Appendices 2).

The Wollondilly Shire Council LGA is designated as potentially having an FDI of 100 as a 1:50 year event (PBP Appendices 2 – Table A2.3).

8.0 Asset protection zones (including any management arrangements or easements including those contained on adjoining lands)

Considering the category of development (SFPP), the minimum specified APZ / setback distances determined for bushfire safety compliance is derived on the basis of tables A2.6 PBP. The minimum specifications for an APZ in this instance are;

- **40m** from '**Woodlands (Grassy)**' vegetation, located on **Flat /Upslopes**

Based on the analysis of slope and vegetation extent likely to persist adjacent to the subject site, the footprint of the proposed development, being considered under the development application, will be separated from the bushfire risk by approximately 41m. As such the proposed development can fully facilitate the required APZ distance between the adjacent bushfire hazard and proposed building envelope.

The proposed separation distances, between the residential development and the bushfire vegetation is 41m, inclusive of a 34m rear setback (onsite) and the rear road reserve (7m).

The extent of the APZ **cannot** be contained fully within the subject property. The APZ would be required to extend onto the adjoining laneway/road reserve along the Southern boundary of the subject site.

PBP 2006 acceptable solutions for APZ (SFPP) compliance states that;

- *an APZ is provided in accordance with the relevant tables / figures [within PBP 2006],*
- *exists are located away from the hazard side of the building,*
- *the APZ is wholly within the boundaries of the development site (exceptional circumstances* otherwise permitting),*
- *mechanisms are in place to provide for the maintenance of the APZ over the life of the development,*
- *the APZ is not located on lands with a slope exceeding 18 degrees, &*
- *the APZ is managed and maintained in accordance with the requirements of 'Standards for Asset Protection Zones (RFS 2005).*

** As an acceptable exceptional circumstance, PBP states an APZ may be located on adjoining land;*

- *where it can be demonstrated that there is a strong likelihood of the adjoining land being developed for future residential or other compatible purposes (e.g. staged development or Urban Development Program or Strategies with supporting development control plans), or*
- *where easements are also required on adjoining land for the purposes of providing access for utilities, right of way, as fire trails, and drainage. These are to be kept clear of free standing vegetation.*

Considering the above, the subject development can facilitate APZ acceptable solutions effectively in as far as providing APZ areas in accordance with PBP.

Most adjoining lands are maintained / managed urban land (normal community and residential allotments) and it is not proposed to remove any vegetation from adjoining properties to achieve compliance with the deemed to satisfy provisions of PBP.

Table 1.0 below outlines APZ compliance or non-compliance where applicable.

Table 1.0 – APZ Compliance	SFPP Development
<i>an APZ is provided in accordance with the relevant tables / figures</i>	Yes / Achievable
<i>exits are located away from the hazard side of the building</i>	The exits to the individual units are to the East, shielded by the stairwells. There are no exits to the South, facing the bushfire risk.
<i>the APZ is wholly within the boundaries of the development site (exceptional circumstances otherwise permitting)</i>	The APZ will extend onto the road reserve to the South.
<i>mechanisms are in place to provide for the maintenance of the APZ over the life of the development</i>	Recommended
<i>the APZ is not located on lands with a slope exceeding 18 degrees</i>	Yes / Achievable
<i>the APZ is managed and maintained in accordance with the requirements of 'Standards for Asset Protection Zones</i>	Recommended

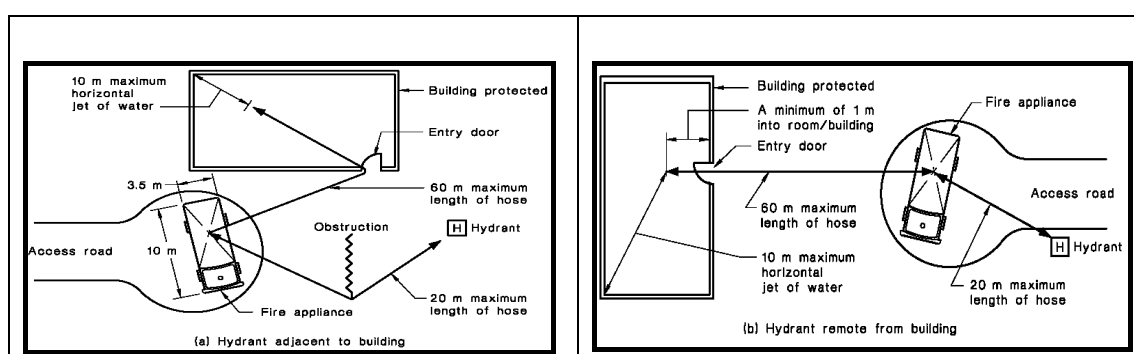
APZ recommendations are as listed section 17.0 (Bushfire Safety & Compliance Recommendations).

9.0 Siting & adequacy of water (in relation to reticulation rates or where dedicated water storage will be required)

The subject development site is connected to the local reticulated town water supply. The size and pressure of the town water supply main servicing the subject development site has not been determined or advised of at the time of this report.

Fire fighting water supply for the subject development site is provided by the current reticulated water supply located within Close Street.

The subject building development (Residential Unit development for Seniors Living) will be designed and constructed to achieve full compliance with AS 2419.1 - 2005 and all BCA requirements in relation to water supply and hydrant travel distances.



(Source: AS2419.1- External Fire Hydrant Location)

Apart from the above, the proponent has not provided any further advice or detail (at the time of this assessment) regarding any further proposed reticulated water infrastructure, supply pressure or guarantee of delivery.

PBP performance criteria for fire fighting water supply area (considered relevant to the subject development) states that:

- *water supplies are easily accessible and located at regular intervals (for a reticulated supply),*
- *fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2005, &*
- *The provisions of parking on public roads in section 4.1.3 in relation to parking are met.*

Fire fighting water supply recommendations are as listed section 17.0 (Bushfire Safety & Compliance Recommendations).

10.0 Capacity of public roads (especially perimeter roads and traffic management treatments)

10.1 External public roads

The subject property is locally accessed directly from Close Street, which is a sealed public roadway approximately 9m in width. The public road reserve is approximately 21m in width.

All other public roadway areas noted on approach to, and departure from, the subject property are well formed and sealed two way public roadways (with cleared verge areas, constructed drainage and ample room for passing or parked traffic) which also service the surrounding commercial and residential area of Thirlmere.

All public roadway areas (within the study area) servicing the subject development site do not exceed 5 Degrees slope.

All public roads servicing the subject property would currently and easily have the capacity to handle an increase in traffic associated with a potential bushfire emergency affecting the area. The above assuming that normal emergency services and traffic supervision is being conducted during an emergency bushfire event.

10.2 Internal roads

There is no internal roadway system proposed to service the subject development. The development contains a short driveway, with direct access to the car parking area only, which then exits directly onto the public roadway, North of the development. A turning bay will be installed within the carparking area.

Any fire fighting operations would be reasonably be conducted directly from the public roadway system.

The location and extent of the driveways and car parking areas are as otherwise denoted Appendix 1.

11.0 Public roads link to fire trails and have two-way access

The subject development site does not propose nor require any fire trail access to service the subject development site, although there is a road reserve to the rear of the subject site which contains an unformed local laneway (7m in width). This laneway also appears to provide access to the rear of some adjacent residential properties.

12.0 Adequacy of access and egress for emergency response

The proposed building development (Residential Units) within the subject property are all located within 50m of the public roadway access point. The current speed limit along Close Street is 50 kph. Close Street will support the operational use of emergency firefighting vehicles. PBP states (as the acceptable solution for normal property access);

- *No specific access requirements apply in an urban area where a 70 metres unobstructed path can be demonstrated between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles (i.e. a hydrant or water supply).*

Provided that the APZ areas are maintained as per the recommendations stated by this report, it is a considered opinion that access or egress for the subject development site would be adequate for the purposes of bushfire safety compliance and emergency response.

13.0 Adequacy of maintenance plans and emergency procedures

13.1 Bushfire maintenance plan

Considering the extent of land within the subject development site that will require ongoing management / maintenance to facilitate APZ compliance (as identified and recommended by this report), it is recommended that a 'simple' landscape vegetation and bushfire management (property maintenance) plan be prepared for the subject development site.

The plan should at least address;

- A proposed schedule of landscape maintenance and activities which ensure the provisions of proposed fire / asset protection management zones, &
- A proposed schedule of building maintenance and activities which ensure the correct installation or function of building design / materials incorporated for bushfire (ember) protection.

PBP Appendix 5 (Bushfire Provisions – Landscaping and Property Maintenance) should be considered when preparing a bushfire maintenance plan for the subject development site and surrounds.

Bushfire maintenance plan recommendations are as listed section 17.0 (Bushfire Safety & Compliance Recommendations).

13.2 Fire emergency procedures

PBP acceptable solutions for emergency and evacuation planning requirements (relevant to the subject development) includes;

- *An emergency/evacuation plan is prepared consistent with the RFS guidelines for the Preparation of Emergency/Evacuation Plan.*
- *Compliance with AS 3745-2002 'Emergency control organisation and procedures for buildings, structures and workplaces for residential accommodation'.*
- *An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedure Manual.*
- *Detailed plans of all Emergency Assembly Areas including "onsite" and "offsite" arrangements as stated in AS 3745- 2002 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.*

Considering the above, it is recommended that a bushfire (specific) emergency and evacuation procedures plan be developed and approved for the development. This would complement any general emergency procedures.

Emergency procedure recommendations are as listed section 17.0 (Bushfire Safety & Compliance Recommendations).

14.0 Construction standards to be used

Direction	Vegetation	Slope	Minimum Distance	Construction Standard
South	Woodlands	Flat / Upslope	>41m	BAL – 12.5

Construction standard recommendations are as listed section 17.0 (Bushfire Safety & Compliance Recommendations).

15.0 Adequacy of sprinkler systems

Sprinkler systems are neither recommended nor required for the subject development site (based on the recommended building design as considered / recommended by this report).

16.0 An assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of PBP

16.1 Performance criteria / acceptable solution compliance

The following table outlines how the subject development complies (or otherwise) with PBP provisions for a Special Fire Protection Purposes development. Compliance is stated as;

- **YES** – the subject development currently facilitates the acceptable solution for bushfire safety,
- **REASONABLY ASSUMED** – the subject development can reasonably facilitate the acceptable solution for bushfire safety, predicated on assumptions of the existing and future design, and activities that are recommended occur,
- **NOT APPLICABLE (N/A)** – the acceptable solution is not applicable to the design or construction of the subject development,
- **NOT CONSIDERED** – the acceptable solution for bushfire safety is considered unnecessary or otherwise overly exceeds the relative risk associated with a bushfire event affecting the subject development. Bushfire safety compliance is based on performance criteria,
- **NO** – the subject development will not facilitate the acceptable solution for bushfire safety compliance. Bushfire safety compliance is based on performance criteria or alternate solution.

Table 4.0 Derived from PBP Chapter 4; 4.2.7 – Standards for Bush Fire Protection Measures for Special Fire Protection Purpose Development

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
<i>radiant heat levels of greater than 10kW/m² will not be experienced by occupants or emergency services workers entering or exiting a building</i>	<i>an APZ is provided in accordance with the relevant tables and figures in PBP</i>	Yes	An APZ has been incorporated into the bushfire protection measures.
	<i>exits are located away from the hazard side of the building</i>	<i>Reasonably assumed</i>	All of the recommended APZ is to be located within managed lands within and adjoining the development. This includes a road reserve area to the Rear (South)
	<i>the APZ is wholly within the boundaries of the development site</i>	No	Recommendation No. 1 of this report.
<i>applicants demonstrate that issues relating to slope are addressed: maintenance is practical, soil stability is not compromised and the potential for crown fires is negated</i>	<i>mechanisms are in place to provide for the maintenance of the APZ over the life of the development</i>	Yes	Recommendation No. 1 & 4 of this report.
	<i>the APZ is not located on lands with a slope exceeding 18 degrees</i>	Yes	
<i>APZs are managed and maintained to prevent the spread of a fire towards the building</i>	<i>in accordance with the requirements of 'Standards for Asset Protection Zones (RFS 2005)</i> <i>(Note - a Monitoring and Fuel Management Program should be required as a condition of development consent)</i>	<i>Reasonably assumed</i>	Recommendation No. 1 & 4 of this report.

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
<i>vegetation is managed to prevent flame contact and reduce radiant heat to buildings, minimise the potential for wind driven embers to cause ignition and reduce the effect of smoke on residents and fire-fighters</i>	Compliance with Appendix 5 (PBP)	<i>Reasonably assumed</i>	Recommendation No. 1 & 4 of this report.
<i>internal road widths and design enable safe access for emergency services and allow crews to work with equipment about the vehicle.</i>	<i>internal roads are two-wheel drive, sealed, all-weather roads</i>	<i>N/A</i>	No internal roads are proposed as part of this development. The proposed development includes only a parking area, located within the subject site.
	<i>internal perimeter roads are provided with at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb) and shoulders on each side, allowing traffic to pass in opposite directions</i>	<i>N/A</i>	
	<i>roads are through roads. Dead end roads are not more than 100 metres in length from a through road, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end</i>	<i>N/A</i>	
	<i>traffic management devices are constructed to facilitate access by emergency services vehicles.</i>	<i>N/A</i>	
	<i>a minimum vertical clearance of four metres to any overhanging obstructions, including tree branches, is provided.</i>	<i>N/A</i>	
	<i>curves have a minimum inner radius of six metres and are minimal in number to allow for rapid access and egress</i>	<i>N/A</i>	
	<i>the minimum distance between inner and outer curves is six metres</i>	<i>N/A</i>	
	<i>maximum grades do not exceed 15 degrees and average grades are not more than 10 degrees</i>	<i>N/A</i>	
	<i>cross-fall of the pavement is not more than 10 degrees</i>	<i>N/A</i>	
	<i>roads do not traverse through a wetland or other land potentially subject to periodic inundation (other than flood or storm surge)</i>	<i>N/A</i>	
	<i>roads are clearly sign-posted and bridges clearly indicate load ratings</i>	<i>N/A</i>	
	<i>the internal road surfaces and bridges have a capacity to carry fully-loaded firefighting vehicles (15 tonnes)</i>	<i>N/A</i>	
<i>Reticulated water supplies are easily accessible and located at regular intervals</i>	<i>access points for reticulated water supply to SFPP developments incorporate a ring main system for all internal roads</i>	<i>N/A</i>	Water/hydrant supplies will be installed as per AS 2419.1-2005 and BCA requirements.

Performance Criteria	Acceptable Solution	Compliance	Assessment / Comment
	<i>fire hydrant spacing, sizing and pressures comply with AS2419. Where this cannot be met, the RFS will require a test report of the water pressures anticipated by the relevant water supply authority, once development has been completed. In such cases, the location, number and sizing of hydrants shall be determined using fire engineering principles</i>	<i>Reasonably assumed</i>	Existing urban area with established complying road system. Utilities located within medium strip / pathways
	<i>the provisions of public roads in section 4.1.3 (PBP) in relation to parking are met</i>	<i>Reasonably Assumed</i>	
location of electricity services will not lead to ignition of surrounding bush land or the fabric of buildings or risk to life from damaged electrical infrastructure	electrical transmission lines are underground	Yes	Recommendation No. 6 of this report. Electrical services within the subject development site are to be relocated underground.
location of gas services will not lead to ignition of surrounding bush land or the fabric of buildings	<i>reticulated or bottled gas is installed and maintained in accordance with AS 1596 - 2002 and the requirements of relevant authorities. Metal piping is to be used.</i>	<i>Reasonably assumed</i>	It is reasonably assumed that any future gas connection will be installed with due regard to the 'Acceptable Solutions' of PBP.
	<i>all fixed LPG tanks are kept clear of all flammable materials and located on the non hazard side of the development</i>	<i>Reasonably assumed</i>	
	<i>If gas cylinders need to be kept close to the building, the release valves must be directed away from the building and away from any combustible material, so that they do not act as catalysts to combustion</i>	<i>Reasonably assumed</i>	
	<i>polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used</i>	<i>Reasonably assumed</i>	
an Emergency and Evacuation Management Plan is approved by the relevant fire authority for the area	<i>an emergency/evacuation plan is prepared consistent with the RFS guidelines for the Preparation of Emergency / Evacuation Plan</i>	Yes	Recommendation No. 4 of this report.
	<i>compliance with AS 3745-2002 'Emergency control organisation and procedures for buildings, structures and workplaces for residential accommodation'</i>	N/A	
	<i>compliance with AS 4083-1997 'Planning for emergencies - for health care facilities'</i>	N/A	
suitable management arrangements are established for consultation and implementation of the emergency and evacuation plan	<i>an Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedures manual.</i>	<i>Reasonably assumed</i>	Recommendation No. 4 of this report.
	<i>detailed plans of all Emergency Assembly Areas including "onsite" and "offsite" arrangements as stated in AS 3745-2002 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.</i>	<i>Reasonably assumed</i>	

16.2 PBP 2006 specific objective assessment

Table 16.2

PBP 2006 Specific Objective	Assessment / Comment
<i>(i) afford occupants of any building adequate protection from exposure to a bush fire</i>	<p>Where the recommendations stated by this report are reasonably and adequately incorporated (where practicable), staff and occupants remaining within the subject development site during a significant bushfire event would be afforded the benefit bushfire protection <i>'measures in combination'</i>.</p> <p>In this respect, fire fighters or occupants remaining within the subject development site or else defending an asset or building during a passing bushfire event should reasonably be better afforded a greater level of protection than otherwise currently exists.</p>
<i>(ii) provide for a defensible space to be located around buildings</i>	Where the recommendation relating to APZ management as stated by this report is reasonably and adequately incorporated (i.e. continued property maintenance), building structures located within close proximity to the primary bushfire hazard would be afforded a level of defensible space.
<i>(iii) provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition</i>	Where the recommendations relating to construction standards (BAL 12.5 Construction) & APZ area stated by this report are reasonably and adequately incorporated, the proposed building structure has been located and designed so as to prevent direct flame contact and material ignition.
<i>(iv) ensure that safe operational access and egress for emergency service personnel and residents is available</i>	Where the recommendations relating to APZ areas as stated by this report are reasonably and adequately incorporated, both emergency services personnel and occupants should be afforded safe access / egress within the subject development site for firefighting or evacuation purposes.
<i>(v) provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zone (APZ)</i>	<p>Where the recommendations relating to construction standards and APZ area stated by this report are reasonably and adequately incorporated, it would be reasonable to assume that regular maintenance works within the subject development would ensure ongoing management and maintenance of bush fire protection measures.</p> <p>Should the standard or upkeep of APZ areas, vegetation maintenance or vehicle access (required for bushfire safety compliance) become compromised during the life of the subject development site, it would also be reasonable to assume such matters would be addressed by the Council or local Fire Authorities through their standard policies and processes.</p>
<i>(vi) ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush fire fighting)</i>	<p>Where the recommendations stated by this report are reasonably and adequately incorporated, the potential water supply facilities servicing the subject development site should be adequate for the purposes of bushfire safety compliance.</p> <p>Similarly, where the installation or connection to electrical and gas services incorporates the recommendations as stated by this report, both emergency services personnel or occupants assisting in bush fire fighting should safely be able to manage potential electrical and gas hazards associated during a bushfire event.</p>

<i>(vii) provide for the special characteristics and needs of occupants [SFPP Development]</i>	Where all recommendations relating to emergency evacuation procedures (planning) as stated by this report are reasonably and adequately incorporated, staff and students located within the subject development site during or preceding a bushfire event should be reasonably aware of safe access / egress options and associated activities to be undertaken.
<i>(viii) provide for safe emergency evacuation procedures [SFPP Development]</i>	As above.

17.0 Bushfire Safety & Compliance Recommendations

The following recommendations (Table 17.1) are proposed for bushfire safety & protection for the proposed Residential Unit development (Seniors Living) at 4 Close Street, Thirlmere NSW 2572.

These recommendations are based upon the relevant provisions (acceptable solutions or performance criteria) for a 'Special Fire Protection Purpose' development in a bushfire prone area and the NSW Rural Fire Service guideline entitled *Planning for Bushfire Protection 2006*.

Table 17.1 – Bushfire Safety / Compliance Recommendations

No.	PBP Standard	Recommendation
1	Asset Protection Zone	<i>The entire subject development site is to be maintained as an Asset Protection Zone (Inner Protection Area) for the life of the development.</i>
2	Fire Fighting Water (Reticulated / Hydrant)	<i>Fire hydrant spacing, sizing and pressures should comply with AS 2419.1 – 2005 and BCA general fire safety provisions.</i>
3	Building Construction Standards	<p><i>Based on the assessment given within 14.0 of this report the following construction standards are recommended:</i></p> <ul style="list-style-type: none"> <i>All elevations: the construction standards outlined within AS3959-2009 Section 5 (BAL 12.5) are to be applied.</i> <i>In addition, AS3959 Section 3 'Construction General' is to be applied where relevant, including: 3.2.1 'Attached Structures'.</i> <p><i>Note: In line with the NSW variation to AS3959-2009 the additional construction requirements outlined within PBP Addendum: Appendix 3 (A3.7) are also to be applied in relation to 'Sarking' and 'Verandas / Decks / Steps / Ramps / Landings'.</i></p>

No.	PBP Standard	Recommendation
4	<p>Maintenance plans and emergency procedures</p> <ul style="list-style-type: none"> Bushfire Maintenance (Landscaping & Building) Emergency / Evacuation Plan 	<p><i>A simple Bushfire Maintenance Plan be developed by a for the subject development site which, at least, clearly identifies;</i></p> <ul style="list-style-type: none"> <i>A proposed schedule of landscape maintenance and activities which ensure the provisions of proposed fire / asset protection management zones, &</i> <i>A proposed schedule of building maintenance and activities which ensure the correct installation or function of building design / materials incorporated for bushfire (ember) protection.</i> <i>An emergency/evacuation plan is prepared consistent with the RFS guidelines for the Preparation of Emergency/Evacuation Plan (existing).</i> <i>An Emergency Planning Committee is established to consult with residents (and their families in the case of aged care accommodation and schools) and staff in developing and implementing an Emergency Procedure Manual.</i> <i>Detailed plans of all Emergency Assembly Areas including "onsite" and "offsite" arrangements as stated in AS 3745-2002 are clearly displayed, and an annual (as a minimum) trial emergency evacuation is conducted.</i>
5	LPG Gas Cylinders	<p><i>As applicable, any future proposed gas supply connections should be designed & located in accordance with PBP.</i></p> <p><i>Bottled gas should be installed and maintained in accordance with AS1596 - 2002 and the requirements of relevant authorities. Metal piping is to be used.</i></p> <p><i>Fixed LPG tanks should be kept clear of all flammable materials and preferably located on the non hazard side of the residential building.</i></p> <p><i>If gas cylinders need to be kept close to the building, the release valves must be directed away from the building and away from any combustible material, so that they do not act as catalysts to combustion.</i></p>
6	Electrical Connection	<p><i>As applicable, any proposed or relocated electrical supply connections should be designed & located in accordance with PBP.</i></p> <p><i>Any new or re-located power line connections to service the subject development site to be located underground.</i></p>

18.0 Conclusion

Based on the above assessment and undertaking of recommendations as stated by this report, the proposed residential unit development, for seniors living, can reasonably comply with the relevant requirements of PBP (alternate solutions, acceptable solutions or performance criteria).

Bushfire safety compliance and mitigation, as purported by this report, for the subject development site comprises a package of '*measures in combination*' primarily including asset protection zoning, construction standards, reticulated water supply, emergency management procedures and bushfire maintenance planning.

Based on the 6 recommendations for bushfire safety and fire protection compliance (as stated by this report), it is a considered opinion that the proposed residential unit development, for seniors living, can reasonably facilitate the aim & objectives of '*Planning for Bushfire Protection 2006*' that are otherwise considered relevant to the subject development under *Section 100B of the NSW Rural Fires Act 1997*.



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19.0 References

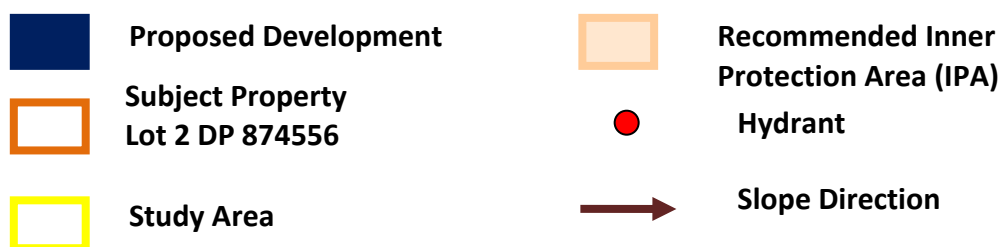
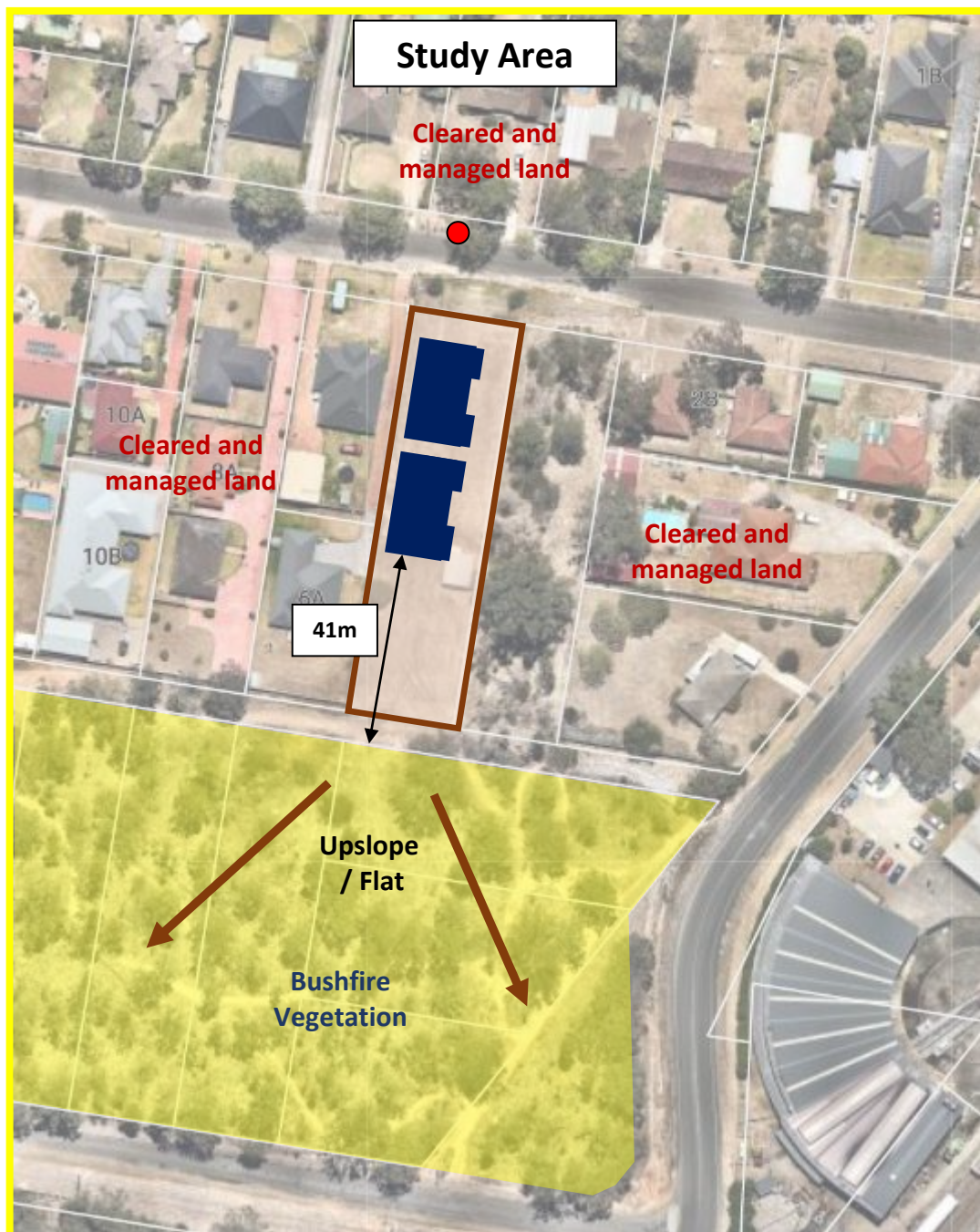
- *Australian Standard 1596:2002, The storage and handling of LP Gas.*
- *Australian Standard 2419:2005, Fire hydrant installations - System design, installation and commissioning.*
- *Australian Standard 3959:2009, Incorporating amendment Nos. 1, 2 & 3, Construction of buildings in bushfire-prone areas.*
- *Planning for Bushfire Protection. A guide for councils, planners, fire authorities & developers (2006) – NSW Rural Fire Service.*

Appendix 1 – Map / Plan Images

Map 1 – Overview



Map 3 APZ / Site Constraints



Appendix 2 – Site Photos (18/9/2018)



Existing site, looking S



Adjacent residential development, looking SW



Adjacent residential development, looking SE



Reticulated water supply



Close Street, looking E



Close Street, looking W



Typical bushfire vegetation, within land to rear of subject site, looking E



Typical bushfire vegetation, within land to rear of subject site, looking SE



Typical bushfire vegetation, within land to rear of subject site, looking SW



Typical bushfire vegetation, within land to rear of subject site, looking W



Aboveground electrical supply