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Bushfire Assessment

Retirement Living Apartments

Lot 1 DP1248137 Jordan Springs Boulevard, Jordan Springs

Lendlease

12 November 2019

(Ref: 17154)

report by
david peterson

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FPA AUSTRALIA (NO.BPAD18882)
BPAD LEVEL 3 ACCREDITED PRACTITIONER
ABN 28 607 444 833

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1 Introduction

Street or property name:	Lot 1 DP 1248137 Jordan Springs Boulevard		
Suburb, town or locality:	Jordan Springs	**Postcode:**	2747
Lot/DP no:	Lot 1 DP 1248137		
Local Government Area:	Penrith City Council		
Type of development:	Retirement living - Apartments		

1.1 Background

Lendlease commissioned Peterson Bushfire to prepare a Bushfire Assessment Report to support a development application for retirement living apartments located on land identified as bushfire prone. This report presents the assessment and recommendations to ensure compliance with the relevant bushfire protection legislation and policy.

This bushfire assessment has been prepared by a consultant accredited by the Fire Protection Association of Australia's BPAD scheme (Accreditation No. BPD-L3-18882).

1.2 Location and description of proposal

The subject land is one of the few remaining parcels of land to be developed within Jordan Springs. It is located on the southern side of Jordan Springs Boulevard adjacent the Wianamatta Regional Park as shown in Figure 1. The site adjoins a large stormwater basin and permanent lake to the south and west, followed by woodland within the Regional Park.

The site has approval for a staged concept development comprising:

- Stage 1 – construction of 51 Independent Living Units (ILU), civil and landscape works;
- Stage 2 – concept development for future Independent Living Apartments (ILA)

The development proposal concerns Stage 2, and the proposal consists of the construction of 139 ILAs across three six-storey buildings plus associated infrastructure such as access roads. A development site plan is included as Figure 2.

1.3 Assessment requirements

The subject land is identified as 'bushfire prone land' on the Penrith Bushfire Prone Land Map (refer to Figure 3) as it is within 100 m of bushland that has the potential to carry a bushfire or contribute to bushfire attack. Proposals involving retirement living are defined as Special Fire Protection Purpose (SFPP) development.

Section 4.46 and 4.47 of the *Environmental Planning and Assessment Act 1979* requires a bushfire assessment of SFPP development proposals on bushfire prone land following the process and methodology set out within Section 100B of the *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008* and the NSW Rural Fire Service (RFS) document *Planning for Bush Fire Protection 2006* (referred to as 'PBP' throughout this report).

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Legend

Subject Land

Proposed Retirement Living Apartments

N

DKGIS

Date: 13/11/2019

0 125 250 500

Metres

Figure 1: The Location of the Subject Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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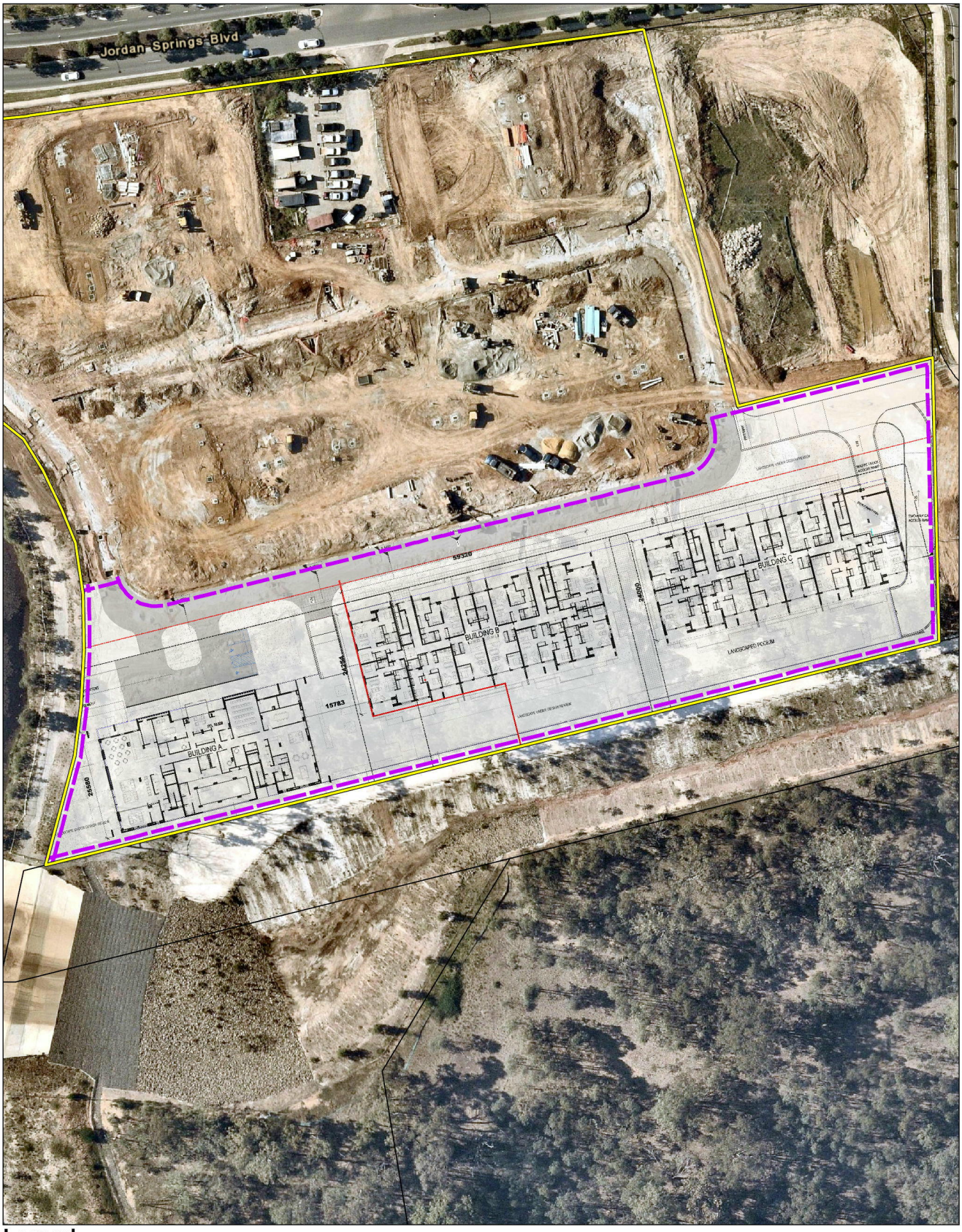

Legend

- Cadastre
- Subject Land
- Proposed Retirement Living Apartments

N

DKGIS

Date: 13/11/2019

0 12.5 25 50

Metres

Figure 2: The Proposal

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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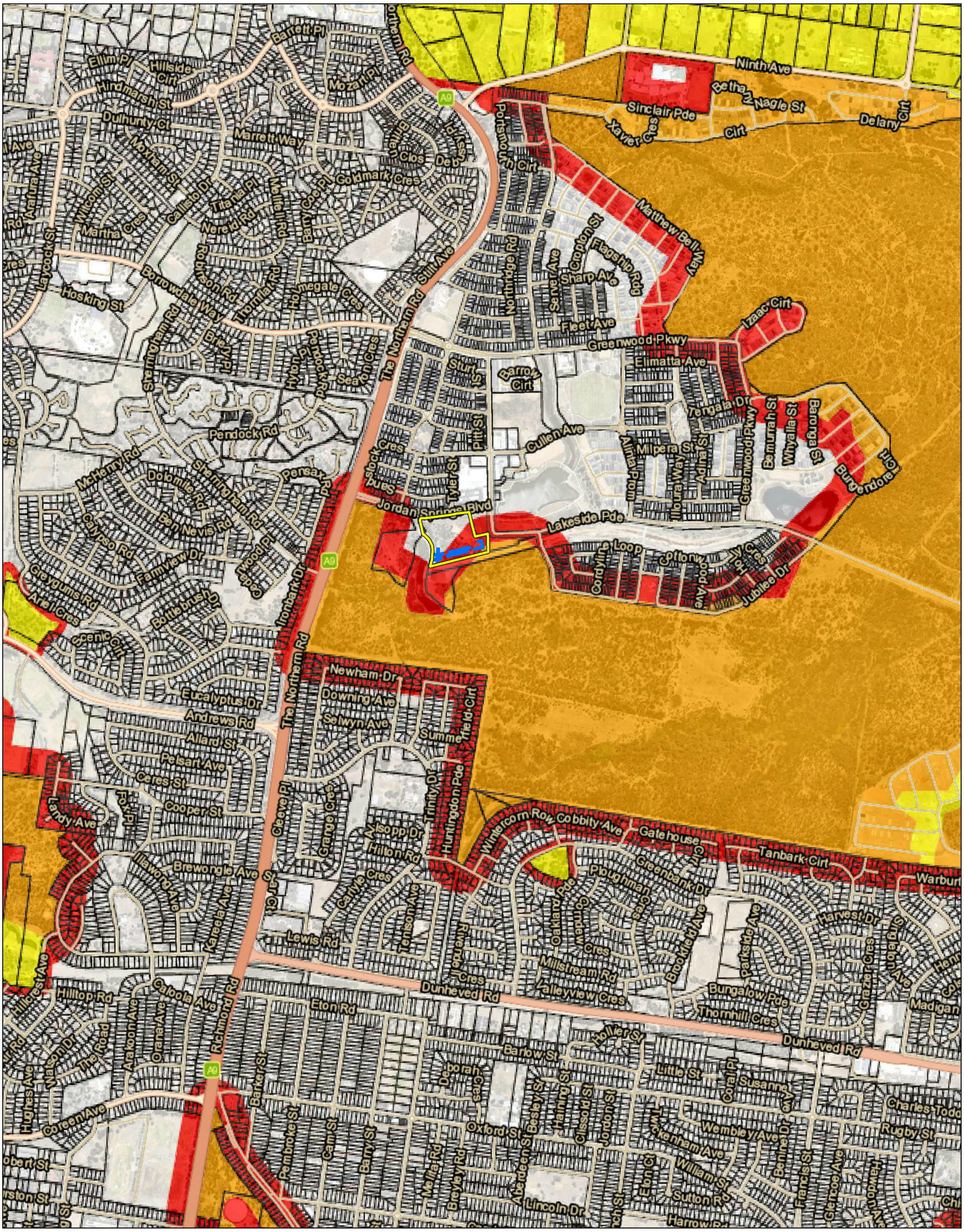

Legend

- Subject Land
- Proposed Retirement Living Apartments

Bushfire Prone Land

- Vegetation Buffer
- Vegetation Category 1
- Vegetation Category 2

N

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Date: 13/11/2019

0 125 250 500
Metres

Figure 3: Bushfire Prone Land

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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2 Bushfire hazard

An assessment of the bushfire hazard is necessary to determine the application of bushfire protection measures such as Asset Protection Zone location and dimension. The following sub-sections provide a detailed account of the vegetation communities (bushfire fuels) and the topography (effective slope) that combine to create the bushfire hazard that may affect bushfire behaviour at the site.

Site assessment took place on 11th January 2018. Photographs of the bushfire hazard are provided in Appendix 1.

2.1 Predominant vegetation

The vegetation within 140 m of the subject land has been assessed in accordance with the methodology specified within PBP. Figure 4 maps the coverage of the bushfire hazard post-development.

The hazard to the south and west of the subject land boundary is representative of the Shale Plains Woodland vegetation community which forms part of the the Coastal Valley Grassy Woodlands structural formation (Keith 2004). This vegetation classification is consistent with the approved St Marys Western Precinct Plan which was guided by the Bushfire Protection Assessment prepared by Bushfire & Environmental Services (2009) and vegetation mapping prepared by Cumberland Ecology (2008). The vegetation classification has also been approved by NSW Rural Fire Service for all previous integrated development applications at Jordan Springs. Recent site assessment has confirmed that the canopy and understorey have not evolved into 'forest' densities since original inspection in 2009. There are small sections of River-flat Forest (Alluvial Woodland) and Shale/Gravel Transition Forest at some boundary locations between Jordan Springs and the Regional Park, however forest does not occur within 140 m of the development site.

The western side of the subject land adjoins a lake within the Regional Park which is not a classified hazard. The lake is a permanent water feature with limited vegetation on water-logged soils around the perimeter. The eastern bank of the lake adjacent the subject land features reeds and a single row of trees along the embankment of a maintenance access road. The negligible vegetation between the boundary and the water is not of a size or density to warrant classification as a bushfire hazard. The vegetation classification was discussed with and agreed by NSW Rural Fire Service during pre-DA consultation in January 2018 (refer to Appendix 2).

The southern side of the subject land adjoins a 25 m wide linear detention basin situated in a dedicated lot that diverts stormwater from the adjacent Jordan Springs residential development to the lake. The basin contains limited landscaping and has stormwater control as its primary function. It is classified as 'managed lands' which was approved as part of the integrated development DA (Council Ref: DA15/1063) for residential apartments at the subject land and adjoining Lot 3989 (NSW Rural Fire Service Ref: DA15/0568, 26 March 2015).

2.2 Effective slope

The ‘effective slope’ influencing fire behaviour has been assessed in accordance with the methodology specified within PBP. This is conducted by measuring the slope that would most influence fire behaviour where the hazard occurs. The slope was determined using a 2 m contour layer as shown on Figure 4 and verified in the field. The slope classes are indicated on Figure 4 as ‘upslope/flat’ to the south and west.

Legend

- Subject Land
- Proposed Retirement Living Apartments
- Contour - 2m

Vegetation Formation

- Woodland

Asset Protection Zone - SFPP

- Asset Protection Zone - 40m

N

DKGIS

Date: 13/11/2019

0 25 50 100

Meters

Figure 4: Bushfire Hazard Analysis and Asset Protection Zone

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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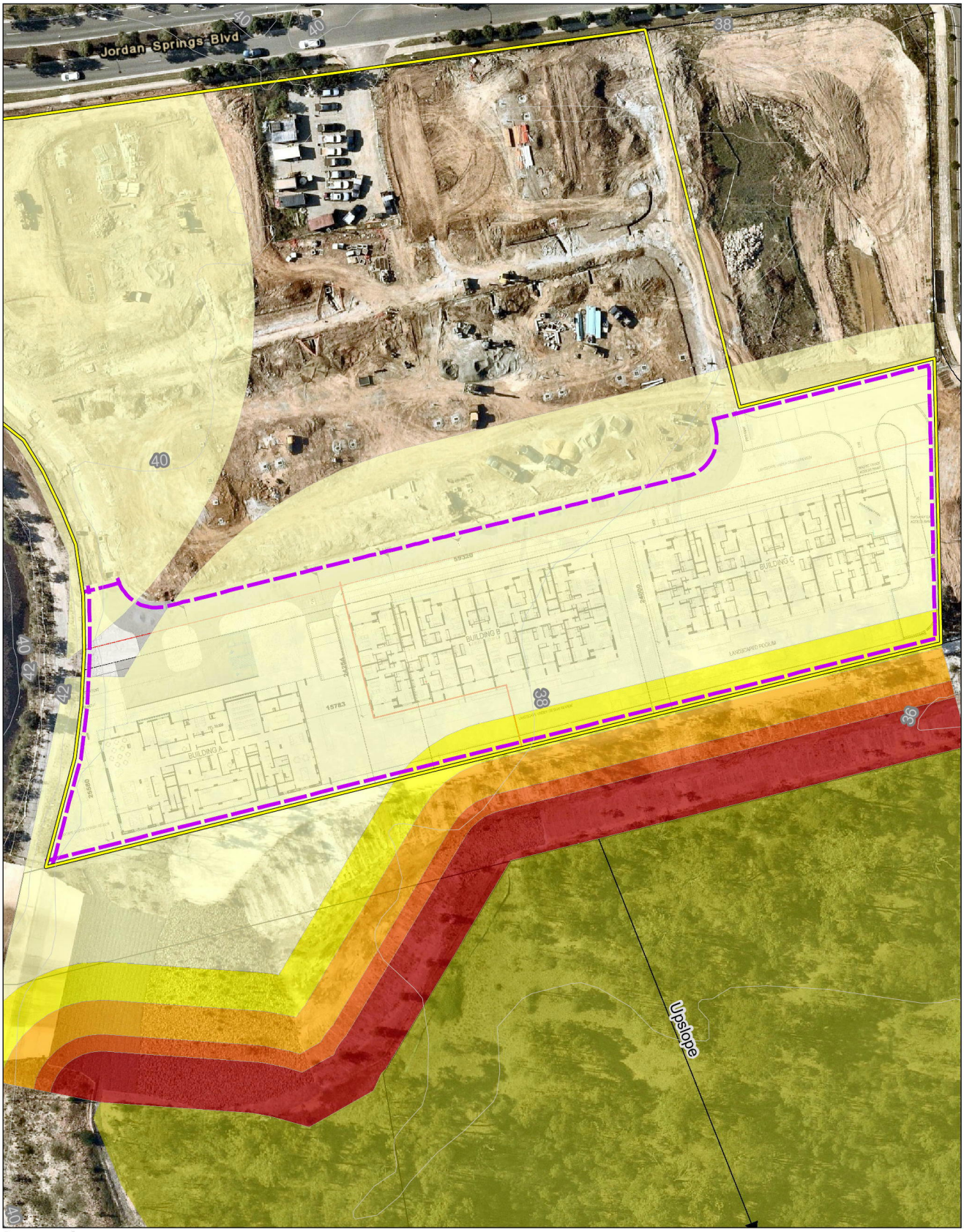

Legend

- Proposed Retirement Living Apartments
- Subject Land
- Cadastre
- Contour - 2m
- **Vegetation Formation**
  - Woodland
- **Bushfire Attack Level**
  - BAL Flame Zone
  - BAL 40
  - BAL 29
  - BAL 19
  - BAL 12.5

N

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Date: 13/11/2019

0 10 20 40

Metres

Figure 5: Bushfire Attack Level

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

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3 Bushfire protection measures

PBP requires the assessment of a suite of bushfire protection measures that in total provide an adequate level of protection for SFPP development. The measures required to be assessed are listed in Table 1 below and are discussed in detail in the remainder of this section.

Table 1: PBP bushfire protection measures

Bushfire protection measures	Considerations
Asset Protection Zones (APZ)	Location and dimension of APZ building setbacks from identified hazards.
Building construction standards	Determining the Bushfire Attack Level (BAL).
Access	Assessment to include access and egress in and out of a developable area, perimeter access and design standards.
Water supply and other utilities	List requirements for reticulated water supply and hydrant provisions, and any static water supplies for fire-fighting.

3.1 Asset Protection Zones (APZ)

Using the vegetation and slope information presented in Section 2 and mapped on Figure 4, an Asset Protection Zone (APZ) suitable for SFPP development has been determined. The APZ is mapped on Figure 4.

In accordance with the PBP Acceptable Solution (Table A2.6), a 40 m wide APZ is required to the south of the development. The APZ will be comprised of a stormwater basin within a 25 m wide lot (Lot 3992), which includes a 4 m wide perimeter maintenance road, and the subject land. Utilising the 25 m wide basin as part of the APZ has been approved in DA15/1063 for residential apartments.

In addition to the required 40 m APZ, Lots 3990 and 3991 will be managed to achieve the performance objectives of an Inner Protection Area (IPA) as described by PBP. This is to ensure a safe operational environment surrounding the development site until the following stages of development occur.

3.2 Bushfire Attack Levels (BAL)

Bushfire Attack Levels (BALs) have been determined for the site in accordance with PBP and *AS 3959-2009 Construction of buildings in bushfire-prone areas* (AS 3959). The BALs are mapped on Figure 5 demonstrating that the proposed apartments are affected by BAL-12.5. Therefore, the development is to be designed and constructed to comply with AS 3959 BAL-12.5. The NSW variation to AS 3959 is also to be applied to the BAL requirements. The variation can be found in the *Planning for Bushfire Protection Addendum Appendix 3 May 2010*: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0004/4396/Planning-for-Bush-Fire-Protection-2006-Addendum-Appendix-3.pdf.

3.3 Access

Alternate access and egress

PBP requires an access design that enables safe evacuation whilst facilitating adequate emergency and operational response. All bushfire prone areas should have an alternate access or egress option depending on the bushfire risk, the density of the development, and the chances of the road being cut by fire for a prolonged period.

The development will have adequate access featuring a primary access road from Jordan Springs Boulevard to the north, and a service road off Lakeside Parade to the east.

The proposed layout and option for alternate access and egress complies with PBP.

Perimeter access

The existing maintenance road along the stormwater basin to the south will act as the perimeter access between the development and the woodland hazard. The maintenance road is 360 m long, 4 m wide and culminates at a cul-de-sac with 17 m diameter. The use of the maintenance road as a perimeter road has been approved in DA15/1063. In addition to the maintenance road, the southern interface of the buildings can be accessed within the subject land.

Design and construction standards

The access roads are to be designed in accordance with the PBP Acceptable Solutions (see Table 2 on the following page).

3.4 Water supply and utilities

Water supply

The development will require fire hydrants to be installed to comply with *AS 2419.1 – 2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419) so that all sides of a building envelope are within 70 m of a hydrant by lay of the hose (or 90 m with a tanker parked in-line maximum 20 m from the hydrant).

Electricity supply

In accordance with PBP, electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed, the vegetation clearance distances are to comply with *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee 2005). The guidelines specify a clearance distance of 0.5 m for a typical connection for residential dwellings.

Gas supply

Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.

Table 2: Design and construction for public roads

Performance Criteria	Acceptable Solutions
• *Firefighters are provided with safe all weather access to structures (thus allowing more efficient use of firefighting resources)*	• *Public roads are two-wheel drive, all weather roads*
• *Public road widths and design that allows safe access for firefighters while residents are evacuating an area*	• *Urban perimeter roads are two-way, that is, at least two traffic lane widths (carriageway 8 metres minimum kerb to kerb), allowing traffic to pass in opposite directions. Non perimeter roads comply with PBP Table 4.1 – Road widths for Category 1 Tanker (Medium Rigid Vehicle), which is a minimum of 6.5 metre carriageway for two-way road with inside edge curve radius >100 and swept path 2.5 metres.* • *The perimeter road is linked to the internal road system at an interval of no greater than 500 metres in urban areas* • *Traffic management devices are constructed to facilitate access by emergency services vehicles* • *Public roads are through roads. Dead end roads are not recommended, but if unavoidable, dead ends are not more than 200 metres in length, incorporate a minimum 12 metres outer radius turning circle, and are clearly sign posted as a dead end and direct traffic away from the hazard* • *Curves of roads (other than perimeter roads) are a minimum inner radius of six metres* • *Maximum grades for sealed roads do not exceed 15 degrees and an average grade of not more than 10 degrees or other gradient specified by road design standards, whichever is the lesser gradient* • *There is a minimum vertical clearance to a height of four metres above the road at all times*
• *The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles*	• *The capacity of road surfaces and bridges is sufficient to carry fully loaded firefighting vehicles (approximately 15 tonnes for areas with reticulated water, 28 tonnes or 9 tonnes per axle for all other areas). Bridges clearly indicated load rating*
• *Roads that are clearly sign posted (with easy distinguishable names) and buildings / properties that are clearly numbered*	• *Public roads greater than 6.5 metres wide to locate hydrants outside of parking reserves to ensure accessibility to reticulated water for fire suppression* • *Public roads between 6.5 metres and 8 metres wide are No Parking on one side with the services (hydrants) located on this side to ensure accessibility to reticulated water for fire suppression*
• *There is clear access to reticulated water supply*	• *Public roads up to 6.5 metres wide provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression* • *One way only public access roads are no less than 3.5 metres wide and provide parking within parking bays and located services outside of the parking bays to ensure accessibility to reticulated water for fire suppression*
• *Parking does not obstruct the minimum paved width*	• *Parking bays are a minimum of 2.6 metres wide from kerb to kerb edge to road pavement. No services or hydrants are located within the parking bays* • *Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road*

4 Conclusion and recommendations

4.1 Summary

The proposal consists of Independent Living Apartments across three six-storey apartment (Special Fire Protection Purpose development) on land mapped as bushfire prone. The proposal will have a compliant APZ to woodland hazard to the south located in the Wianamatta Regional Park. A compliant access design with alternate emergency egress and perimeter access is also achieved.

4.2 Conclusion

This report presents an assessment of retirement living development at Lot 1 DP 1248137 Jordan Springs Boulevard, Jordan Springs. The assessment demonstrates that the proposal, together with the recommendations (see below), complies with s100B *Rural Fires Act 1997*, Clause 44 of the *Rural Fires Regulation 2008* and *Planning for Bush Fire Protection 2006*.

4.3 Recommendations

The recommendations made within this assessment are repeated below:

1. A 40 m APZ is required to the woodland hazard to the south within the Regional Park beyond the stormwater basin (Lot 3992). Lot 3992 may contribute to the 40 m APZ distance.

2. The subject land is to be managed to achieve the performance objectives of an Inner Protection Area (IPA) as described by PBP.

3. The apartment buildings are to be designed and constructed to comply with BAL-12.5 of *AS 3959-2009 Construction of buildings in bushfire-prone land*. The NSW variation to AS 3959 is also to be applied to the BAL requirements. The variation can be found in the *Planning for Bushfire Protection Addendum Appendix 3 May 2010*: http://www.rfs.nsw.gov.au/__data/assets/pdf_file/0004/4396/Planning-for-Bush-Fire-Protection-2006-Addendum-Appendix-3.pdf.

4. The proposed internal roads are to be designed in accordance with the PBP Acceptable Solutions for the design and construction of public roads in bushfire prone areas (see Table 3 of this Bushfire Assessment Report).

5. The development will require fire hydrants to be installed to comply with AS 2419.1 – *2005 Fire Hydrant Installations - System Design, Installation and Commissioning* (AS 2419).

6. Electricity should be underground wherever practicable. Where overhead electrical transmission lines are installed, the vegetation clearance distances are to comply with *ISSC 3 Guideline for Managing Vegetation Near Power Lines* (Industry Safety Steering Committee 2005).

7. Any gas services are to be installed and maintained in accordance with *AS/NZS 1596-2014 The storage and handling of LP gas*.

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Cumberland Ecology 2008. *St Marys Property – Western Precinct Biodiversity Assessment*. A technical report prepared for Maryland Development Company.

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Standards Australia. 2009 (Amendment 3). *Construction of buildings in bushfire-prone areas*, AS 3959, Third edition 2009, Standards Australia International Ltd, Sydney.

Standards Australia. 2014. *The storage and handling of LP Gas*, AS/NZS 1596-2014, Standards Australia International Ltd, Sydney.

Appendix 1 – Site photographs

Photograph 1: Woodland on upslope to the west of Lot 3990

Photograph 2: Insignificant vegetation along eastern side of lake

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Photograph 3: Stormwater basin and perimeter maintenance road along southern interface

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Appendix 2 – RFS pre-DA consultation

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From	:	Jason Maslen <Jason.Maslen@rfs.nsw.gov.au>
To	:	"David Peterson"<david@petersonbushfire.com.au>
Subject	:	RE: Jordan Springs seniors living site
Date	:	Thu, 25 Jan 2018 16:37:51 +1100

Hi Dave,

Thanks for our brief discussion. As discussed, the revised layout looks to be an improvement over the previous plan with the second independent living unit building relocated to the eastern side of the lake. This location benefits from a perimeter road. On the basis of your comments, it would appear reasonable to consider the lake shores as a non-hazard at the northern end of the lake. As much information about the current and future condition of the lake would be helpful to reinforce this. Treatment of the interface of the lots which directly abut the eastern side of the lake should also be provided.

I hope this assists with your discussions with Council.

Regards,

Jason

Jason Maslen | Team Leader, Development Assessment and Planning | Planning and Environment Services
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PREPARE. ACT. SURVIVE.

From: David Peterson [mailto:david@petersonbushfire.com.au]
Sent: Tuesday, 16 January 2018 5:04 PM
To: Jason Maslen <Jason.Maslen@rfs.nsw.gov.au>
Subject: Jordan Springs seniors living site

Hi Jason,

Happy new year.

I just left a message on your office phone in regards to a catch-up on this pre-DA. You would recall we had a pre-DA meeting over the phone in late November regarding this site. I have attached the RFS advice summary you provided.

I was hoping we could have a 10 minute chat about the revised layout options attached. The issues raised were how to classify the lake and to address the perimeter access. Since we spoke I have gone to site and liaised with Lendlease and come up with the bushfire constraints. The two options vary only slightly. In short:

1. Hazard is woodland predominantly on upslope except to south of Lots 7-13 where it is downslope 0-5 degrees.
2. The lake is a permanent water feature with minor vegetation on water-logged soils around the perimeter up to the lot boundary. The western bank has grasses in mud, dead trees and exotics, and the eastern bank is very narrow at a few metres wide. After viewing the site my opinion is that it is not a classifiable hazard.
3. Perimeter roads have been provided where there is a hazard adjoining. The adjoining land at the eastern end below Lakeside Parade has been cleared.

Can we chat sometime this week?

Cheers

Dave

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