



Reference number: 0026/2021/A

Bushfire Hazard Assessment

742 Henry Lawson Dr, Picnic Point



Figure 1: Googlemaps street view of the site (April 2021)

Prepared in good faith for Lily Pejkcic for
submission with her DA

By Daniel Cleland

PROBABAL

13 August 2021

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Bush Fire Risk Assessment Certificate

This form is completed by a recognised consultant in bush fire risk assessment in accordance with Sec 4.14 (1) (b) of the Environmental Planning and Assessment Act 1979 No.203 (EPAA 1979).

PROPERTY ADDRESS:	742 Henry Lawson Drive, Picnic Point (Lot 61 DP 819327)
DESCRIPTION OF PROPOSAL:	Construction of a dual occupancy development
PLAN REFERENCE (relied upon in report preparation):	N/A; no plans were relied upon in the report preparation
BAL RATING (If the BAL rating is 40, Council should consider seeking concurrence from the NSW RFS under Sec 4.14 (1A) EPAA 1979 as this is a performance solution; if the BAL rating is FZ the performance solution is outside the scope of the National Construction Code and concurrence from the NSW RFS must be obtained under Sec 4.14 (1A) EPAA 1979):	LOW
DOES THE PROPOSAL RELY ON PERFORMANCE SOLUTIONS? (If YES Council may consider seeking concurrence from the NSW RFS under Sec 4.14 (1A) EPAA 1979 if it is not satisfied as to 4.14 (1) (a) & (b) EPAA 1979)	No


I, Daniel Cleland of Probabal have carried out a bushfire risk assessment on the abovementioned proposal and property. A detailed Bush fire Assessment Report is attached which includes the submission requirements set out in Appendix 2 of Planning for Bushfire Protection 2019 (PBP 2019) together with recommendations as to how the relevant specifications and requirements are to be achieved.

REPORT REFERENCE:	0026/2021/A
REPORT DATE:	13 August 2021
CERTIFICATION NO/ACCREDITED SCHEME:	FPAAB/BPAD No. 49524

I hereby certify, in accordance with Sec 4.14 of the Environmental Planning and Assessment Act 1979 No 203:

1. That I am a person recognised by the NSW Rural Fire Service as a qualified consultant in bushfire risk assessment; and
2. That subject to the recommendations contained in the attached Bushfire Risk Assessment Report, the proposed development conforms to the relevant specifications and requirements.

I am aware that the Bushfire Assessment Report, prepared for the abovementioned site is to be submitted in support of a development application for this site and will be relied upon by the Council as the basis for ensuring that the bush fire risk management aspects of the proposed development have been addressed in accordance with PBP 2019.

SIGNATURE: 	DATE: 13 August 2021
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Abbreviations / References / Links

APZ: Asset Protection Zone

AS3959:2018: *Australian Standard 3959 – 2018 Construction of buildings in bushfire prone areas* (<https://www.saiglobal.com/online/>)

BAL: Bushfire Attack Level

BFPL: Bush Fire Prone Land

BPAD: Bushfire Planning and Design

BPM: Bushfire Protection Measure

DA: Development Application

EPAA 1979: Environmental Planning and Assessment Act 1979 (www.legislation.nsw.gov.au)

EPAR 2000: Environmental Planning and Assessment Regulation 2000 (www.legislation.nsw.gov.au)

FFDI: Forest Fire Danger Index

FDR: Fire Danger Rating (<https://www.rfs.nsw.gov.au/fire-information/fdr-and-tobans?a=1421>)

FPA: Fire Protection Association Australia

Googlemaps: (www.google.com/maps)

Keith 2004: *Ocean Shores to Desert Dunes: the native vegetation of NSW and ACT* by David Keith, July 2004, reprinted June 2006, ISBN 1 74137 920 2 DEC2006/31

LEP: Local Environmental Plan (www.legislation.nsw.gov.au)

LGA: Local Government Area

NCC: National Construction Code/Building Code of Australia (www.abcb.gov.au)

Nearmap: Mapping and imagery application (www.nearmap.com/au/en)

NSW Planning Portal: NSW Government planning/mapping portal (www.planningportal.nsw.gov.au)

NSW RFS: New South Wales Rural Fire Service (www.rfs.nsw.gov.au)

PBP 2019: *Planning for Bushfire Protection 2019* dated November 2019 ISBN 978-0-646-99126-9 (https://www.rfs.nsw.gov.au/_data/assets/pdf_file/0005/130667/Planning-for-Bush-Fire-Protection-2019.pdf)

PCA: Principal Certifying Authority

SEED Portal: (<https://www.seed.nsw.gov.au/>)

Sixmaps: (<https://maps.six.nsw.gov.au/>)

SWS: Static Water Supply

1.0 Executive Summary

It is proposed to construct a dual occupancy development at 742 Henry Lawson Drive, Picnic Point (Lot 61 DP 819327) on bush fire prone land (BFPL), being other development under Sec 8 of *Planning for Bush Fire Protection 2019* (PBP 2019) and subject to consideration under Sec 4.14 of the *Environmental Planning and Assessment Act 1979* (EPAA 1979). The proposal meets the acceptable solutions in PBP 2019 (which contain the current specifications and requirements as specified in clause 272 of the *Environmental Planning and Assessment Regulation 2000* EPAR 2000).

The site is 634.5 sqm in area and is zoned R2 – Low Density Residential with direct access to Henry Lawson Drive to the northeast, which is a public through road. Reticulated water, sewer and electricity are available. The site has a southwest aspect with gentle slopes up to 5 degrees downslope towards the Georges River, 170 metres to the southwest. No significant environmental constraints were identified.

Although the site is mapped as BFPL, it has been determined via a desktop assessment that the vegetation plot (plot 1) causing the site to be BFPL meets the criteria for low threat vegetation - exclusions under A1.10 of PBP 2019, therefore it is appropriate that the site is not considered BFPL. There are other mapped category 1 bush fire hazards 103-120 metres to the south (plot 4), and 320 metres to the southwest.

Table 1: Summary of the bush fire hazard assessment from Sec 8 (FFDI 100; Table A1.12.5 PBP 2019)

Aspect	Northwest	Southwest	Southeast	Northwest
Vegetation	Plot 1 remnant forest (low threat vegetation – exclusion A1.10 PBP 2019); managed land beyond	Managed land & plot 3 (managed low threat vegetation – exclusion A1.10 PBP 2019); plot 4 (forest) the south	Managed land & plot 4 (forest) to the south	Managed land
Distance	0m (plot 1 adjoining)	90m to plot 3; >100m to plot 4	>100m to plot 4	>100m
Slope	N/A	N/A	N/A	N/A
Adjoining Features	Adjoining plot 1 causing the site to be BFPL is a low threat vegetation – exclusion (A1.10 PBP 2019); see Sec 8.1 & 12	Managed lands; plot 3 also deemed managed/excluded (A1.10 PBP 2019) and not BFPL	Managed lands for >100m	Managed lands for >100m
FFDI	100	100	100	100
APZ	N/A	N/A	N/A	N/A
BAL	BAL LOW	BAL LOW	BAL LOW	BAL LOW

Relevant bush fire protection measures (BPM's) are discussed in Sec 9, however no formal BPMs are recommended for the proposed development. Detailed compliance with PBP 2019, the NCC and AS3959-2018 is demonstrated in Sec 9, 10 and Appendix 1. Plans were not provided or necessary to support the assessment of bush fire risk. The proposal was found to comply with the acceptable solutions provided in PBP 2019, and is therefore recommended for approval from a bushfire perspective i.e. Council may elect to be satisfied as to Sec 4.14 (1) (a) & (b) EPAA 1979. No conditions for bush fire protection are recommended to be included in any development consent.

2.0 Introduction

The client (Lily Pejic) has engaged Probabal to prepare a bushfire hazard assessment to support a DA for the construction of a dual occupancy development at 742 Henry Lawson Drive, Picnic Point. The subject site and surrounding land is mapped as bush fire prone land (BFPL), therefore triggering the provisions of Sec 4.14 of the *Environmental Planning and Assessment Act 1979* (EPAA 1979) and the associated requirements of *Planning for Bushfire Protection 2019* (PBP 2019).

3.0 Purpose

The purpose of this report is to provide the stakeholders with an independent assessment of the bushfire hazard by a suitably qualified consultant, as referred to in A2.7 of PBP 2019. It aims to demonstrate that the proposed development complies with the acceptable solutions in PBP 2019, and will make appropriate recommendations for any BPMs considered necessary to meet the requirements of PBP 2019.

4.0 Scope

The scope of this report is limited to providing a bushfire hazard assessment and recommendations for the proposed development on the subject site, in accordance with A2.2 PBP 2019.

5.0 Site

The subject site is located at 742 Henry Lawson Drive, Picnic Point (Lot 61 DP 819327), within the Canterbury-Bankstown LGA. A site inspection has not been undertaken due to a desktop assessment revealing that the bush fire risk is low, and the hazard adjoining the northwest boundary causing the site to be BFPL may be treated as a low hazard exclusion in accordance with A1.10 of PBP 2019. A site inspection would not allow access to vegetation plots for further assessment being on restricted or private properties, and was prohibited at the time of writing due to public health orders.

The site is an existing residential allotment 634.5 square metres in area, accessed directly from Henry Lawson Drive to the northeast, which is a public through road. The site contains an existing dwelling and outbuildings. The site is serviced by reticulated water, sewer, and mains electricity.

According to the NSW Planning Portal, the site is zoned R2 - Low Density Residential, with a portion at the front/northeast ranging from 6-9 metres length being zoned SP2 – Infrastructure under the Bankstown LEP 2015. Dual occupancies, dwelling houses and secondary dwellings are permitted with consent in the R2 zone. As this report demonstrates that the site should not be considered to be BFPL, there are no bush fire protection measures (BPMs) formally required which may be considered to conflict with the objectives of the zone.

The site is surrounded primarily by managed gardens within curtilage of buildings, however there is remnant forest vegetation on the adjoining lot to the northwest which does not strictly meet the tree canopy cover or canopy separation requirements in PBP 2019 to be considered managed to an APZ standard, causing the site being mapped as BFPL. This remnant forest does however meet other criteria for low threat vegetation – exclusions under A1.10 of PBP 2019, and, under 7.1.2 of the NSW RFS *Guide for Bush Fire Prone Land Mapping Version 5b November 2015*, therefore the site may be considered to not be BFPL. There are also other mitigating features as detailed in Sec 8.1 and 12.

The site and surrounding land slopes gently at approximately 5 degrees to the southwest to the Georges River, therefore the site has a southwest aspect.

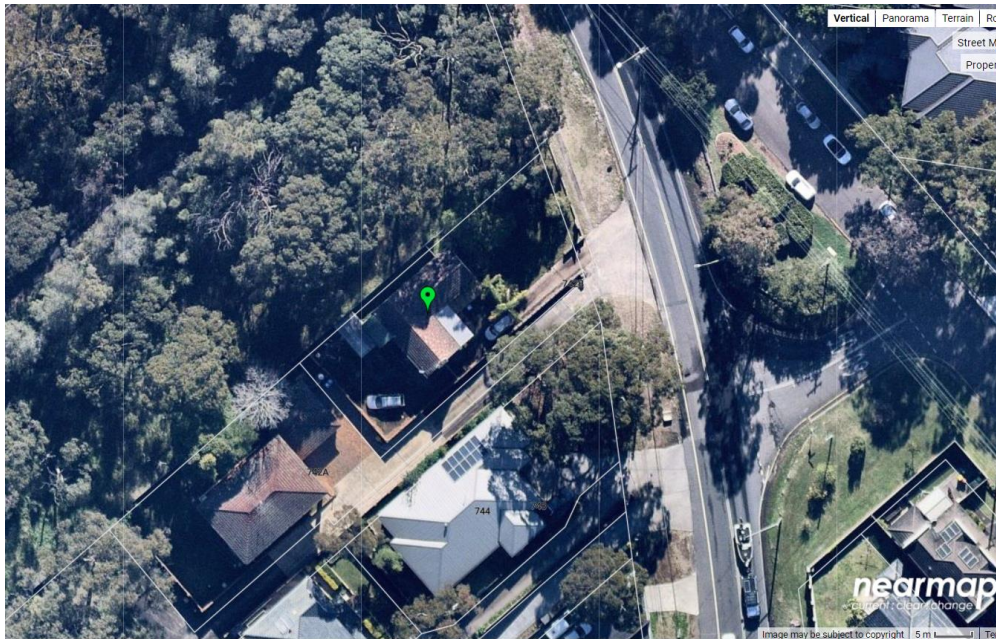


Figure 2: 03/07/2021 Nearmap aerial image of site (marked with a green balloon) and immediate surroundings



Figure 3: 03/07/2021 Nearmap aerial image of site (marked with a green balloon) in its larger surroundings

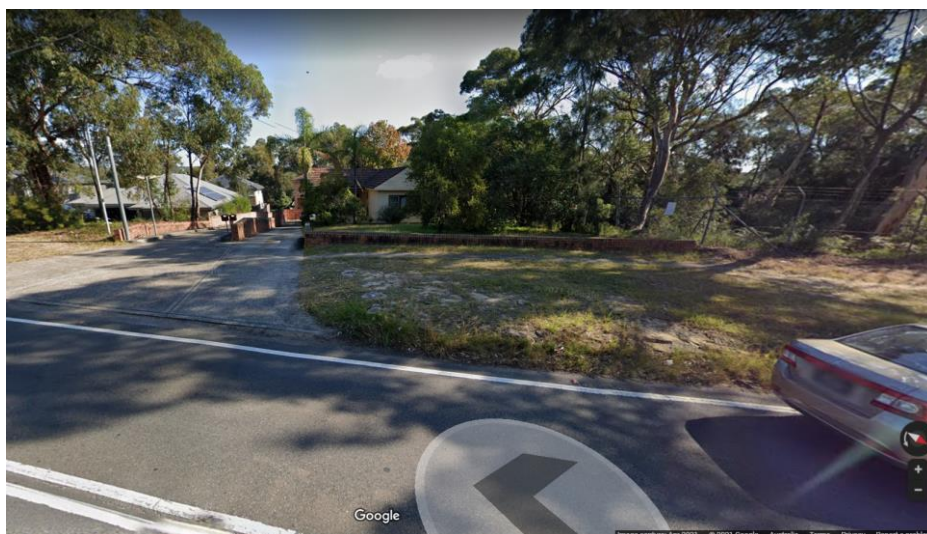


Figure 4: Site viewed from Henry Lawson Dr (source: googlemaps)

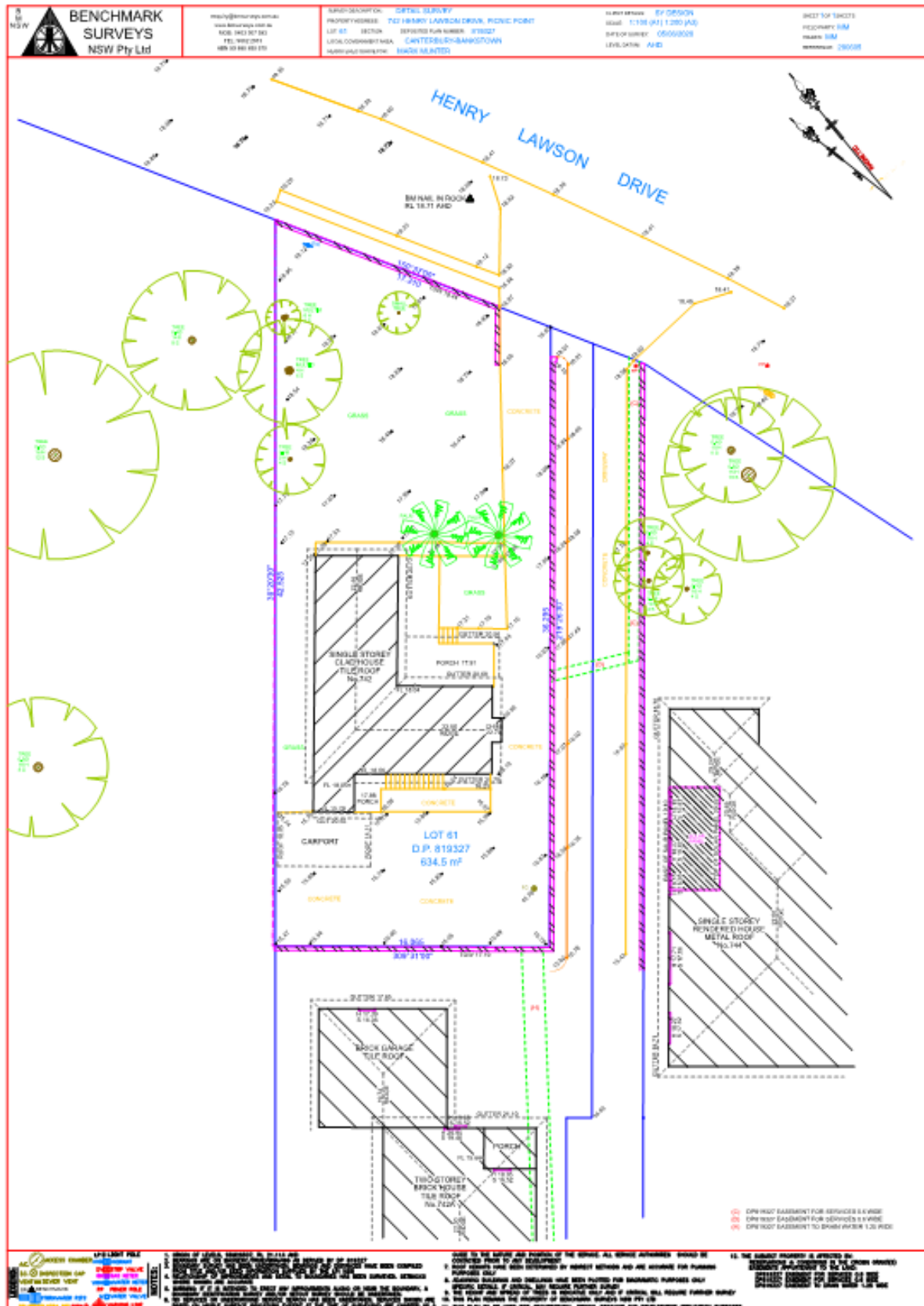


Figure 5: Site survey provided by the client

6.0 Proposal

It is proposed to construct a dual occupancy development. No plans were provided by the client, as plan preparation was occurring at the time of writing, and plans were not considered necessary to support the assessment of bush fire risk in the circumstances.

The proposed development would typically need to comply with Chapter 4, 5, 7 and 8 of PBP 2019, however, as this report demonstrates that the entire site is BAL-LOW, and the site could be considered as not being BFPL, there are no BPMs formally required under PBP 2019 or the NCC.

7.0 Bush Fire Threat

In accordance with A2.2 PBP 2019, it is confirmed that the site is mapped as BFPL, with the site being within the 100 metre buffer to category 1 vegetation adjoining the northwest boundary of the site:



Figure 6: BFPL map from NSW Planning Portal; site is outlined in yellow dashes

Fully developed bush fires are most likely to approach the vicinity of the site from large expanses of category 1 vegetation located to the southwest on the opposite side of the Georges River, 170 metres from the category 1 vegetation adjoining the site, and 320 metres from the site. There is also a 3.8 hectare area of category 1 vegetation located to the southeast, 120 metres from the site, and 134 metres from the category 1 vegetation adjoining the site.

Although the mapped area of category 1 vegetation adjoining the site is 1.18 hectares, Sec 8.1 below demonstrates that the actual area of remnant forest vegetation is less than 1 hectare, therefore with greater than 100 metres separation from other areas of category 1 or 2 vegetation, the category 1 vegetation adjoining the site may be excluded in accordance with A1.10 of PBP 2019, and correspondingly the site not considered as BFPL. The inclusion of category 1 vegetation adjoining the site in the BFPL map should not be considered a significant error to be rectified in a future revision of the BFPL map, as inclusion assures the ongoing management at less than 1 hectare in area detailed within Sec 8.1 and 12.

8.0 Bushfire Hazard Assessment

The following assessment has been undertaken in accordance with Appendix 1 of PBP 2019:

8.1 Vegetation

The predominant form of vegetation within 140 metres of the subject site was determined in accordance with A1.2 and A1.10 of PBP 2019. The following map identifies the vegetation plots:



Figure 7: Vegetation plots in a 140m radius around the site, marked with a green balloon from 03/07/2021 nearmap image

8.1.1 Plot 1

The category 1 vegetation causing the site to be BFPL is located at 740 Henry Lawson Drive (Lot 1 DP 776440) adjoining the northeast boundary of the site and contains a Sydney Water pumping station. A review of googlemaps (street view), images provided by the client, together with *Vegetation Map – Sydney Metro Area v3.1 2016 E – VIS 4489* from the SEED portal revealed the predominant form of remnant vegetation within plot 1 belongs to the ‘**Dry Sclerophyll Forests**’ formation as described in Chapter 5 of Keith (2004). This formation may be further divided in to a ‘shrubby’ sub-formation, having understoreys dominated by hard-leaved shrubs but very sparse grass cover. More specifically,

plot 1 belongs to the **'Sydney Coastal Dry Sclerophyll Forests'** class as described in pages 146-147 of Keith (2004) as shown below:

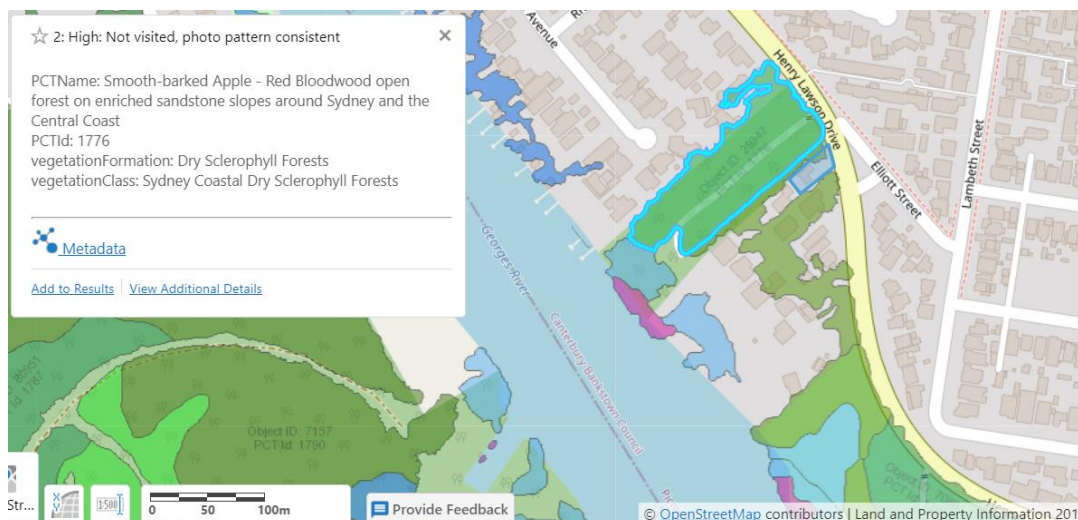


Figure 8: Predominant Keith (2004) vegetation formation and class in plot 1 adjoining the site (outlined and shaded blue)



Figure 9: Remnant vegetation in the centre of the image adjoining the site to the left of the image (source: googlemaps)

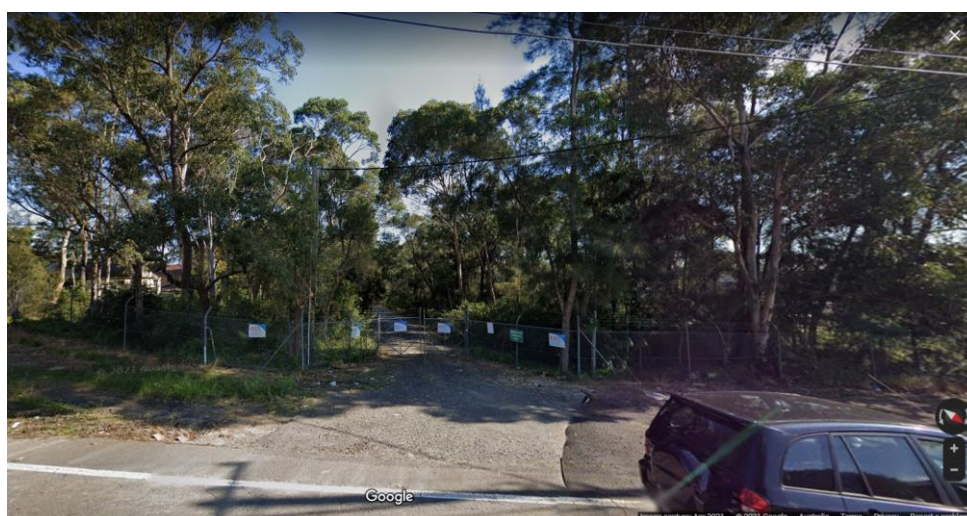


Figure 10: Sydney Water asset access at the centre of plot 1 adjoining the site (source: googlemaps)



Figure 11: Northern extent of the remnant vegetation adjoining the site (source: googlemaps)

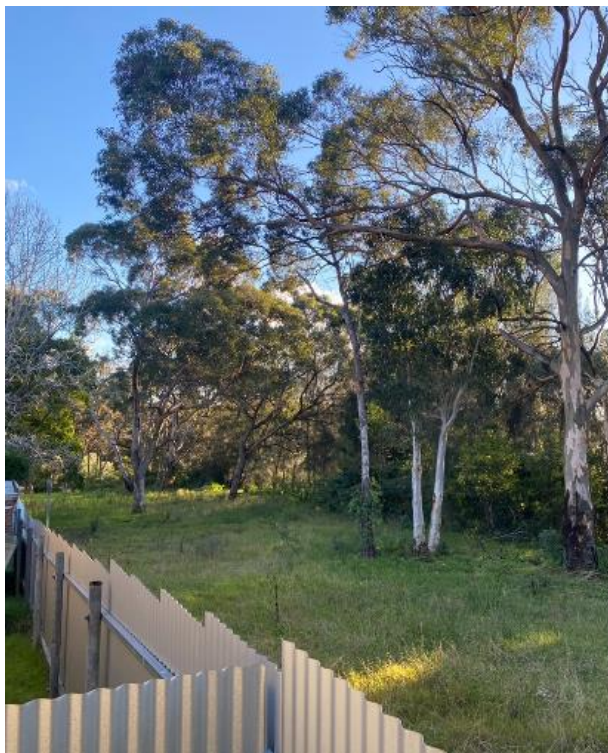


Figure 12: Image of remnant vegetation adjoining the northwest boundary of the site provided by the client



Figure 13: Image of remnant vegetation adjoining the northwest boundary of the site provided by the client

According to the *Vegetation Map – Sydney Metro Area v3.1 2016 E – VIS 4489*, there is a small 0.19 hectare area of **‘Forested Wetlands’** formation as described in Chapter 9 of Keith (2004) approximately 130 metres southwest of the site, belonging to the **‘Coastal Floodplain Wetlands’** class as described in pages 226-227 of Keith (2004) as shown below, however in accordance with A1.2 of PBP 2019, the vegetation formation providing the greater hazard shall be used for the purpose of assessment of vegetation, therefore this forested wetland will be considered a dry sclerophyll forest in the calculation of area of vegetation within plot 1:

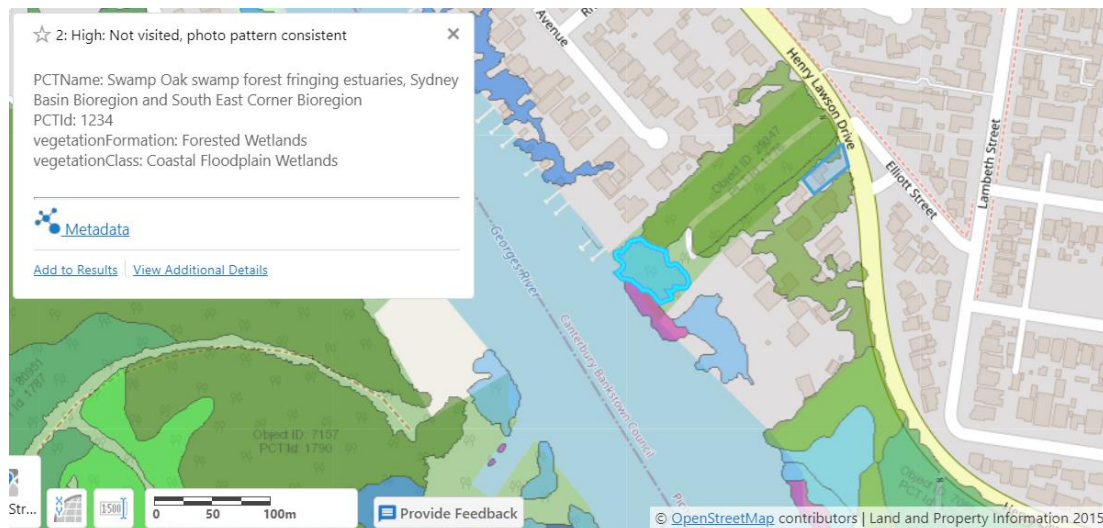


Figure 14: Secondary Keith (2004) vegetation formation and class within plot 1 adjoining the site (outlined and shaded blue)

Although the mapped area of category 1 vegetation adjoining the site is 1.18 hectares, the actual extent of remnant dry sclerophyll forest vegetation and tree canopy cover in plot 1 within 140 metres of the site and extending greater than 140 metres of the site was measured to be less than 1 hectare in area (0.88 hectares as shown below) due to Sydney Water driveway access and infrastructure; hazard management activities in the understorey adjacent to residential properties is likely to result in a further reduction in unmanaged forest area as detailed in Sec 12. Plot 1 is located greater than 100 metres from other areas of category 1 or 2 vegetation; the 100 metre separation distance contains areas of remnant vegetation on private properties within plot 3 where the canopy cover and canopy separation are considered managed to an APZ standard.

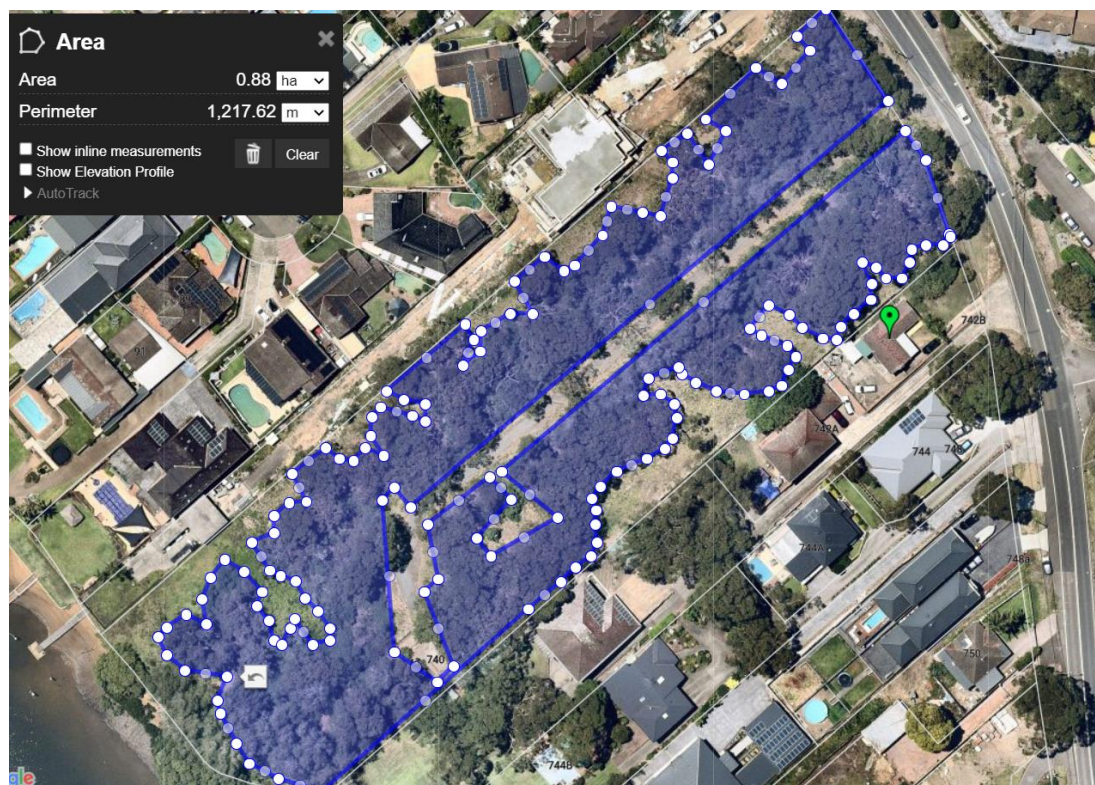


Figure 15: Measurement of maximum remnant dry sclerophyll forest tree canopy cover on a 27/12/2020 nearmap image (which is <12 months old and clearly demonstrates canopy cover without shadows); site is marked with a green balloon

The remnant vegetation in plot 1 which causes the site to be mapped as BFPL is therefore considered low threat vegetation – exclusions under A1.10 of PBP 2019 being ‘single areas of vegetation less than 1 hectare in area and greater than 100 metres separation from other areas of category 1 or 2 vegetation’, therefore is not required to be considered for the purposes of PBP 2019. This assessment is also consistent with the exclusions provided in 7.1.2 of the NSW RFS *Guide for Bush Fire Prone Land Mapping Version 5b November 2015*, therefore the site may be considered not to be BFPL.

Application of A1.11.1 in PBP 2019 was considered for the assessment of vegetation in plot 1, however A1.10 of PBP 2019 is considered to take precedence over the simplified approach for vegetation less than 1 hectare in area being treated as a rainforest. A1.11.1 of PBP 2019 is only considered applicable where A1.10 of PBP 2019 cannot apply to exclude vegetation from being a hazard, for example where the area of vegetation less than 1 hectare, however is not separated from other areas of category 1 or 2 vegetation. In this instance, as A1.10 of PBP 2019 applies, A1.11.1 is not considered applicable.

8.1.2 Plot 2

According to the *Vegetation Map – Sydney Metro Area v3.1 2016 E – VIS 4489*, there is a small 0.1 hectare area of ‘**Saline Wetlands**’ formation as described in Chapter 10 of Keith (2004) approximately 160 metres southwest of the site, belonging to the ‘**Mangrove Swamps**’ class as described in pages 236-237 of Keith (2004) as shown below, however, as this vegetation is greater than 140 metres from the site, and is specifically excluded from being considered in accordance with A1.10 of PBP 2019, this vegetation will be disregarded from the assessment of vegetation, and will be excluded from the calculation of area of vegetation in plot 1:

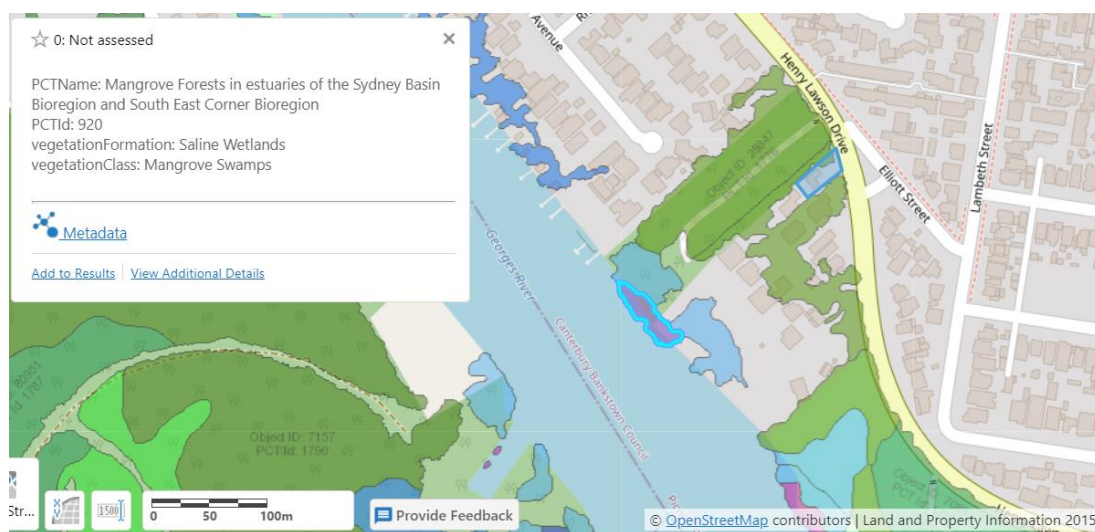


Figure 16: Keith (2004) vegetation formation and class in plot 2 excluded from the vegetation assessment; site marked blue

8.1.3 Plot 3

Although mapped as a potential forested wetland in *Vegetation Map – Sydney Metro Area v3.1 2016 E – VIS 4489* (see below), the vegetation within plot 3 between plot 1 and plot 4 is considered a low threat vegetation - exclusion in accordance with A1.10 of PBP 2019 on the basis that:

- the tree canopy cover and separation appears to meet the criteria for managed land, being managed generally to APZ standards;
- the areas of plot 3 on private lands are managed gardens and lawns within curtilage of buildings;

- Although some parts of plot 3 are not within private properties, there appears to be some management and reduction of fuel loads occurring based on current and historic nearmap aerial images;
- Some of the vegetation in plot 3 is mapped as saline wetlands, which as described in plot 2 above are excluded for the purposes of PBP 2019;
- there is generally greater than 20 metres separation from remnant trees within plot 3 and vegetation within plots 1 and 4;
- plot 3 will continue to be separated from plot 4 by managed lands on private properties together with the APZ detailed in Sec 12 around plot 4;
- plot 3 does not appear to constitute an unmanaged forested wetland hazard, whereas areas of plot 1 and 4 are unmanaged;
- there appears to be insufficient fuel in plot 3 to sustain or carry a bush fire from plot 4 to plot 1, or for plot 3 to ignite and spread fire to plot 1 due to ember attack;
- plot 3 is not mapped as BFPL, consistent with the above desktop assessment.

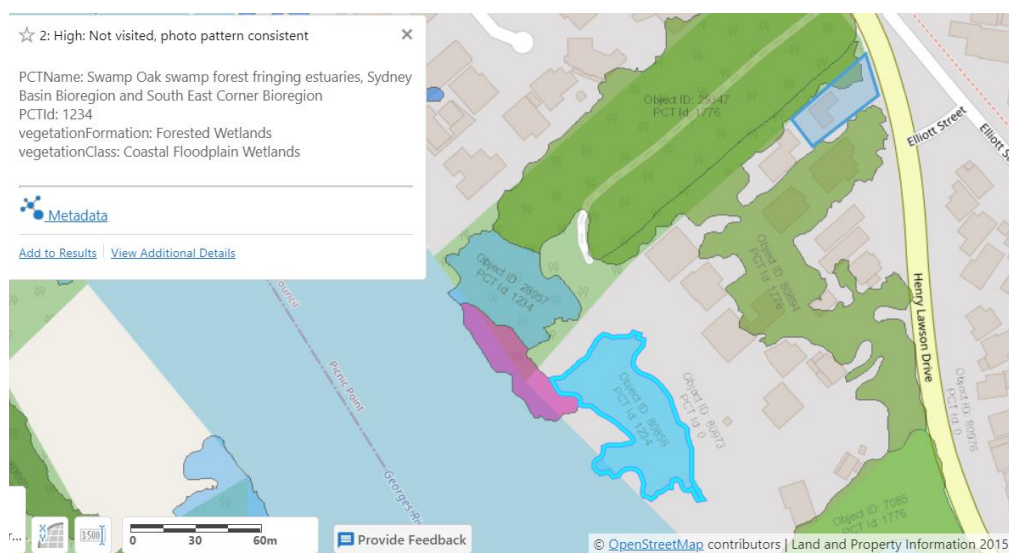


Figure 17: Keith (2004) vegetation formation and class in plot 3 to be excluded from being a hazard; site marked blue



Figure 18: Full potential extent of plot 3 on a 27/12/2020 nearmap aerial image (site marked with a green balloon)

8.1.4 Plot 4

Plot 4 exceeds 1 hectare in area, and is considered appropriately mapped as BFPL. According to *Vegetation Map – Sydney Metro Area v3.1 2016 E – VIS 4489*, vegetation within plot 4 at 760A Henry Lawson Drive (Lot 7 DP 431720) and beyond belongs to the **‘Dry Sclerophyll Forests’** formation as described in Chapter 5 of Keith (2004). This formation may be further divided in to a ‘shrubby’ sub-formation, having understoreys dominated by hard-leaved shrubs but very sparse grass cover; more specifically, belonging to the **‘Sydney Coastal Dry Sclerophyll Forests’** class as described in pages 146-147 of Keith (2004) as shown below. For the purpose of A1.2 and Table A1.12.5 of PBP 2019, plot 4 is considered ‘Forest (wet and dry sclerophyll) including Coastal Swamp Forest, Pine Plantations, and Sub-Alpine Woodland’.



Photo courtesy Ross Peacock

Dry Sclerophyll Forest

Open tree canopy dominated by eucalypt species (typically 10-30m in height) with crowns that touch and overlap. Canopy allows most sunlight to penetrate supporting growth of a prominent understorey layer varying between hard-leaved shrubs to luxuriant soft leaved shrubs, ferns and herbs.

Figure 19: Plot 4 vegetation formation (source: PBP 2019 p. 81)

Plot 4 appears primarily unmanaged, however there is a public reserve within plot 4 known as Lambeth Reserve which is a maintained public reserve/parkland. Vegetation mapped as a category 1 hazard within plot 4 is located 120 metres from the site, however there is vegetation at the frontage of 756 Henry Lawson Drive adjoining plot 4 which has the potential to carry a bush fire from plot 4; this area which may have the potential to sustain fire was measured to be 103 metres from the site.

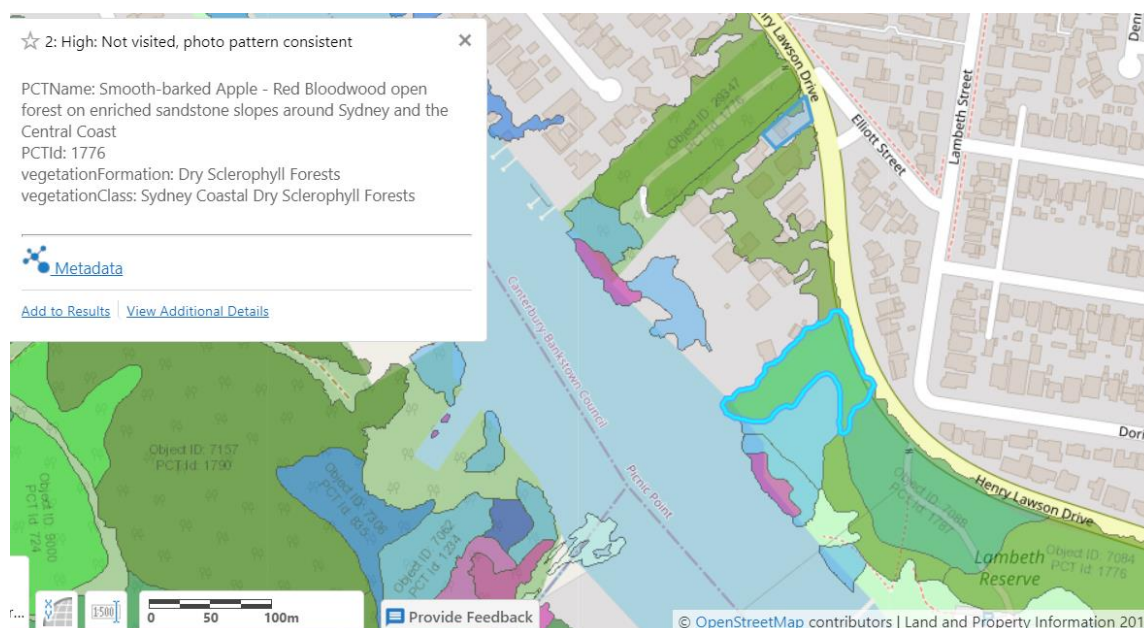


Figure 20: Keith (2004) vegetation formation and class in plot 4 located >100m from the site



Figure 21: The extent of plot 4 located closest to the site, within and to the southeast of 756 Henry Lawson Dr

8.2 Distance

Separation distances between the site and vegetation plots are tabled below. All vegetation plots were deemed low threat vegetation exclusions in accordance with A1.10 of PBP 2019, or, were greater than 100 metres from the site.

Table 1: Distances from the site to vegetation plots

Plot no.	Vegetation classification	Distance
1	A1.10 PBP 2019 low threat vegetation - exclusion	0m (adjoining)
2	A1.10 PBP 2019 low threat vegetation - exclusion	N/A; >140m
3	A1.10 PBP 2019 low threat vegetation - exclusion	90m
4	Forest	103m



Figure 22: Distance measurement from the site to plot 3 and 4 in nearmap

8.3 Slope

Slope is not applicable to the assessment, as all vegetation within 100 metres of the site has been classified as low threat vegetation – exclusions in accordance with A1.10 of PBP 2019, therefore is not required to be considered. It is noted however, in accordance with A1.4 and A1.5 of PBP 2019, 10 metre topographic contours in sixmaps revealed that the site slope and effective slope under the vegetation plots within 100 metres of the site is:

- 0-5 degrees downslope to the west and south towards the Georges River,
- Upslope/flat to the north and east.



Figure 23: 10m topographic contours in sixmaps; site shaded yellow and outlined red

8.4 FFDI

According to NSW RFS Local Government Areas FDI – May 2017, the FFDI prescribed in A1.6 of PBP 2019 for Canterbury-Bankstown LGA is FFDI 100, therefore table A1.12.5 of PBP 2019 is applicable to the BAL determination.

8.5 Bushfire Attack Level (BAL) Determination

Table A1.12.5 of PBP 2019 revealed the highest calculated BAL is BAL-LOW due to all vegetation plots being classified as low threat vegetation – exclusions in accordance with A1.10 of PBP 2019, or being greater than 100 metres from the site. BAL-LOW means there is insufficient bush fire threat to warrant specific bush fire construction requirements.

8.6 Summary table

Table 2: Bush fire hazard assessment summary

Aspect	Northwest	Southwest	Southeast	Northwest
Vegetation	Plot 1 remnant forest (low threat vegetation – exclusion A1.10 PBP 2019); managed land beyond	Managed land & plot 3 (managed low threat vegetation – exclusion A1.10 PBP 2019); plot 4 (forest) the south	Managed land & plot 4 (forest) to the south	Managed land
Distance	0m (plot 1 adjoining)	90m to plot 3; >100m to plot 4	>100m to plot 4	>100m
Slope	N/A	N/A	N/A	N/A
Adjoining Features	Adjoining plot 1 causing the site to be BFPL is a low threat vegetation – exclusion (A1.10 PBP 2019); see Sec 8.1 & 12	Managed lands; plot 3 also deemed managed/excluded (A1.10 PBP 2019) and not BFPL	Managed lands for >100m	Managed lands for >100m
FFDI	100	100	100	100
APZ	N/A	N/A	N/A	N/A
BAL (table A1.12.5 PBP 2019)	BAL LOW	BAL LOW	BAL LOW	BAL LOW

9.0 PBP 2019 Requirements

The following BPMs are relevant for infill and other development, however, there are no BPMs formally recommended to be included as conditions of development consent. A detailed assessment is contained in Appendix 1.

9.1 Asset Protection Zones (APZs)

The site and adjoining lands to the southeast between the site and plot 4 is already well managed to an APZ standard. Although it is considered good practice to require APZs for development on BFPL, even where the BAL for a proposed building is assessed as BAL-LOW, because it has been demonstrated that the entire site should not be mapped as BFPL due to vegetation within 100m being a low threat vegetation exclusion, and, that the nearest vegetation considered a hazard is between 103-120 metres to the southeast in plot 4, a formal requirement to manage the site to APZ standards via a condition of development consent is not considered necessary.

Some ember attack travelling distances exceeding 100 metres may be experienced to the site and adjoining plot 1 in highest fire danger ratings (FDRs). Accordingly, given the proposed increase in residential density and minor risk of ember attack, the client, designer, consent authority and PCA should give consideration to ensuring any landscape plan demonstrates compliance with Appendix 4 of PBP 2019 as an informal precautionary measure to ensure that any proposed landscaping does not increase risks to buildings from ember attack.

9.2 Siting and Design

There are some provisions for siting and design in Sec 3.3 of PBP 2019, however, given it has been demonstrated that the site should not be mapped as BFPL, these provisions are not applicable to the proposed development, and the proposed development may occur anywhere within the site. Given the proposed increase in residential density and minor risk of ember attack, the client, designer, consent authority and PCA should give consideration to marginally exceeding the minimum setback

of 900 millimetres to the northwest boundary, and the rear/southwest boundary to enable reasonable access for firefighting.

9.3 Construction Standards

As detailed in Sec 8.5, and as required by A2.2 of PBP 2019, the calculated BAL is BAL-LOW due to vegetation within 100 metres of the site being a low threat exclusion pursuant to A1.10 of PBP 2019. There is insufficient bush fire threat to warrant specific bush fire construction requirements under PBP 2019 or AS3959:2018 as formal conditions of development consent.

Some ember attack travelling distances exceeding 100 metres may be experienced to the site and adjoining plot 1 in highest FDR. Accordingly, the client, designer, consent authority and PCA should give consideration to ensuring any architectural plans demonstrate the use of non-combustible materials for the external elements of the proposed building, metal screens with apertures less than 2 millimetres in metal frames to doors and windows, sarking under roof cladding, and non-combustible fencing and gates as an informal precautionary measure.

9.4 Access

It has been demonstrated that the site should not be considered BFPL, therefore an assessment against the relevant access provisions in PBP 2019 is not considered necessary as there is insufficient risk to warrant any BPMs. Given the proposed increase in residential density, it is noted that access roads are two-wheel drive all-weather roads, the capacity of roads appears adequate for firefighting vehicles, fire hydrants are available in the surrounding area, the site adjoins a public through road (Henry Lawson Drive), and, the site meets the criteria for an urban area for there to be no specific access requirements as formal conditions of development consent.

There were no access constraints in the surrounding region identified in a desktop assessment which would conflict with the considerations for an increase in residential density, or the associated strategic principals in Sec 4.1 of PBP 2019. As the surrounding area is primarily not BFPL (except to the southeast), and there are not a large number of properties in the vicinity of the site which are mapped as BFPL, the region is not considered difficult to evacuate in a bush fire emergency, with numerous evacuation and refuge options available.



Figure 24: Large scale BFPL showing minimal BFPL in the vicinity of the site (marked yellow in the centre of the map)

9.5 Water Supplies

It has been demonstrated that the site should not be considered BFPL, therefore an assessment against the relevant water supply provisions in PBP 2019 is not considered necessary as there is insufficient risk to warrant any BPMs. Given the proposed increase in residential density, it is noted that the site is serviced by reticulated water, and although exact street hydrant locations were not established, a review of telegraph pole markings in googlemaps street imagery revealed there is a street fire hydrant located outside the road carriageway somewhere between 748A-752 Henry Lawson Drive (located 50-85 metres south of the site). There were no other hydrant markings noted outside the site or within 100 metres to the north.

It cannot be established that hydrant spacing, design and sizing comply with AS2419.1:2005, however it is likely that pressure and flow would be adequate given the elevation of the site is less than 20 metres above water level in the Georges River and any nearby elevated water reservoir would serve to provide high pressures in reticulated water infrastructure. Given it has been demonstrated that the site is at low risk from bush fire, this is considered adequate without further assessment. A static water supply for firefighting is not considered necessary.

Some ember attack travelling distances exceeding 100 metres may be experienced to the site and adjoining plot 1 in highest FDR. Accordingly, the client, designer, consent authority and PCA should give consideration to ensuring that all above-ground water service pipes external to the building are metal, including and up to any taps, and, that any water tanks are metal with a 200 millimetre or greater opening at the top, located within 4 metres of the driveway and provided with pumps and garden hoses as an informal precautionary measure.

9.6 Electrical Services

The existing electrical supply is located above ground. There is insufficient bush fire risk to warrant any assessment or formal requirements for electrical services under PBP 2019.

9.7 Gas Services

It has been demonstrated that the site should not be considered BFPL, therefore an assessment against the relevant gas supply provisions in PBP 2019 is not considered necessary as there is insufficient risk to warrant any BPMs. Some ember attack travelling distances exceeding 100 metres may be experienced to the site and adjoining plot 1 in highest FDR. Accordingly, as an informal precautionary measure, the client, designer, consent authority and PCA should give consideration to ensuring that:

- reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;
- all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;
- connections to and from gas cylinders are metal;
- polymer-sheathed flexible gas supply lines are not used; and
- above-ground gas service pipes are metal, including and up to any outlets.

9.8 Landscaping

As detailed in Sec 9.1, because it has been demonstrated that the entire site should not be considered BFPL, there is insufficient risk to warrant any BPMs as formal conditions of development consent. Some ember attack travelling distances exceeding 100 metres may be experienced to the site and adjoining plot 1 in highest FDR. Accordingly, given the proposed increase in residential

density and minor risk of ember attack, the client, designer, consent authority and PCA should give consideration to ensuring any landscape plan has minimal vegetation, demonstrates compliance with Appendix 4 of PBP 2019, includes a 1 metre wide non-combustible surface adjacent to any proposed building, and ensures any tree branches from trees adjoining the site will not overhang the roof as an informal precautionary measure.

The client may wish to contact Stephen Shaw of BGIS on 0456 913 100 to arrange pruning of any branches from trees on plot 1 which may overhang the roof of the proposed development before construction commences.

9.9 Emergency Management

Although there are no formal requirements for emergency management in Table 7.4a or Sec 8.2.1 of PBP 2019, and, that it has been demonstrated that the entire site should not be mapped as BFPL, and, that there is insufficient risk to warrant any BPMs as formal conditions of development consent, Sec 2.7 and 3.6 PBP 2019 recommends that the owners/occupiers prepare a bush fire survival plan available from: <https://www.rfs.nsw.gov.au/plan-and-prepare/bush-fire-survival-plan>

The plan should include monitoring the NSW RFS app “fires near me”, FDRs, and if planning to leave rather than staying to defend, leaving at the earliest possible time to ensure minimal congestion in evacuation routes associated with last-minute decisions to evacuate. Although the bush fire risk to the site is minimal, a decision to stay and defend should be made with caution on days of highest FDR (in particular during catastrophic FDR, where evacuation is warranted), or if occupants are not physically and mentally prepared for bush fire.

Some ember attack to the site and plot 1 vegetation could be anticipated in the highest FDR, however the overall risk is minimal, and there is reasonable access to the site, surrounding properties, water supplies, and hazard vegetation to enable firefighting intervention in a bush fire emergency.

10.0 NCC & AS3959 Compliance

This report demonstrates that there are no formal requirements for bush fire protection under PBP 2019 or the NCC. For the purposes of AS3959:2018, the entire site, and consequently any proposed development is assessed as BAL-LOW. There is insufficient bush fire threat to warrant specific bush fire construction requirements, however there are some informal considerations detailed in Sec 9.3.

11.0 Environmental Considerations

In accordance with A2.2 PBP 2019, a statement is required addressing the likely environmental impact of the proposed BPMs. Although a comprehensive assessment of environmental impact is beyond the scope of this report, it is noted that as there are no BPMs formally recommended, there would be no environmental impact resulting from any BPMs.

12.0 Other Considerations

With regard to the aims and objectives in Sec 1.1 of PBP 2019, and the requirements of A2.2 PBP 2019, there are features that will serve to mitigate the impact of bush fire to the proposed development. In addition to the assessment of plot 1 as a low hazard exclusion under A1.10 of PBP 2019, and the managed lands between the site and adjoining plot 1 to the bush fire hazard in plot 4, the following mitigating features are noted:

- The site and surrounding properties are included in the current *Bankstown / Hurstville Bush Fire Risk Management Plan (2013)* as a human/residential asset with reference number 39 on Map 4 of 6. Plot 4 is considered a high-risk hazard, with a 3A priority, and is to be treated with a combination of hazard reduction, property planning, and community education.

As shown below, plot 1 adjoining the site is not included as a hazard requiring any management where adjoining private properties, which supports the assessment of plot 1 as a low-risk vegetation exclusion despite being a category 1 hazard in the BFPL map. Plot 4, however is a hazard with an APZ where adjoining private lands, to be managed by mechanical clearing and prescribed burning. Plot 4 contains a public parkland (Lambeth Reserve) and is partly managed by Council within and at the perimeter which somewhat mitigates the risk of fully developed bush fires and significant ember attack to the site.



Figure 25: The site and surroundings are to be protected from the hazard within plot 4

- The client advises that contractors periodically manage the remnant hazard within plot 1 where adjoining the site and surrounding private properties. Sydney Water was requested to provide details of any plan of management for plot 1; they advised that the land (plot 1) is owned by the Department of Defence, however the pumping station within plot 1 is a Sydney Water asset.

A telephone discussion on 12 August 2021 with Stephen Shaw – BGIS Estate Manager for land, pest and vermin (ph. 0456 913 100) who manages plot 1 on behalf of the Department of Defence confirmed that there is a bush fire management plan in place for plot 1 which includes hazard reduction strategies, however a copy of the plan could not be provided, being a restricted Commonwealth document. This adequately supports the assessment of plot 1 as a low-risk vegetation exclusion despite being a category 1 hazard in the BFPL map.

13.0 Recommendations

It has been demonstrated that category 1 vegetation adjoining the site which causes the site to be BFPL qualifies for low threat vegetation – exclusions under A1.10 of PBP 2019, and other category 1 vegetation was located greater than 100 metres from the site, therefore, the site may be considered to not be BFPL, and there should be no formal requirements for bush fire protection under PBP 2019.

Accordingly, as there are no BPMs required or recommended, there are no recommended conditions of development consent for bush fire protection, and a Bush Fire Management Plan is not considered necessary as suggested in A2.6 of PBP 2019. Council is therefore requested to consider approving the development from a bush fire perspective, and may be satisfied with Sec 4.14 (1) (a) & (b) of the EPAA 1979. Alternatively, in the event that Council does not support this determination, concurrence may be sought from the NSW RFS under Sec 4.14 (1A) of the EPAA 1979.

14.0 Conclusion

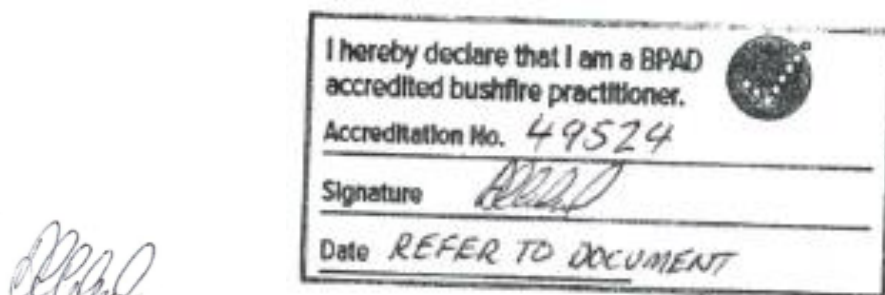
It is demonstrated that by virtue of complying with the acceptable solutions in PBP 2019, the aims and objectives of PBP 2019 have been satisfied, and the site may be considered as not BFPL. Council may therefore elect to determine that the requirements of 4.14 (1) (a) & (b) of the EPAA 1979 are satisfied, and may determine the DA without any conditions or requirements for bush fire protection.

15.0 Authorisation

I Daniel Cleland of Probabal hereby certify that in accordance with Sec 4.14 of the EPAA 1979:

1. I am a person who is recognised by the NSW Rural Fire Service as a qualified consultant to undertake bushfire risk assessments, and,
2. Provided the contents and recommendations of this report are adhered to, the development conforms to the specifications and requirements that are relevant to the development, being the document entitled *Planning for Bush Fire Protection* dated November 2019 (ISBN 978-0-646-99126-9) as referred to in clause 272 EPAR 2000; it is at Council's discretion if concurrence from the NSW RFS is sought prior to the issue of development consent.

I am aware this report will be lodged with a Development Application.



13 August 2021

Daniel Cleland

PROBABAL

ABN No. 54 702 996 097

Mob: 0439 249 617

Email: dan@probabal.com.au

Web: www.probabal.com.au

Dip Environmental Health & Building Surveying - TAFE

Grad Cert Bushfire Protection – UWS

BPAD Accredited Bushfire Consultant (BPAD no. 49524)



**BRONZE
MEMBER**
Fire Protection
Association Australia



Appendix 1: PBP 2019 & NCC Compliance

NOTE: This table is provided as a guide for the provisions which are relevant to the proposed development, despite it being established that the site may be considered as not being BFPL. Probabal may be contacted for further clarification or advice if required.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
PBP 2019 Sec 1.1 (Aim)	<i>The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.</i>		Complies; despite the site being mapped as BFPL, it has been determined in accordance with PBP 2019 that the risk of bush fire to the site does not warrant any formal BPMs for the protection of life and property due to the nearest vegetation plot deemed a hazard being >100m from the site.
PBP 2019 Sec 1.1 (objectives)	<i>afford buildings and their occupants protection from exposure to a bush fire;</i>		Complies; the occupants of the proposed development are unlikely to be exposed to an approaching bush fire, only ember attack from unmanaged vegetation >100m from the site. There is insufficient risk to warrant any BPMs.
PBP 2019 Sec 1.1 (objectives)	<i>provide for a defensible space to be located around buildings;</i>		Complies; it is anticipated that the development will be setback ≥900mm from the adjoining vegetation in plot 1 (which is considered a low threat vegetation exclusion under A1.10 PBP 2019). Sec 9.2 suggests marginally exceeding this. The adjoining plot 1 appears to have some form of hazard management occurring, increasing the defensible space; See Sec 12.
PBP 2019 Sec 1.1 (objectives)	<i>provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings;</i>		Complies; appropriate separation is provided, and is not considered necessary as the vegetation causing the site to be BFPL (plot 1) was found to meet the criteria for low threat

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			<p>vegetation – exclusions under A1.10 of PBP 2019.</p> <p>The adjoining plot 1 vegetation appears to have some form of hazard management occurring, increasing the separation to the remnant forest <1ha in area and >100m from other hazards. There are no formal BPMs required, however some informal precautionary measures are included in Sec 9.</p>
PBP 2019 Sec 1.1 (objectives)	<i>ensure that appropriate operational access and egress for emergency service personnel and occupants is available;</i>		Complies; being an urban area, there are no specific access requirements in Sec 7 of PBP 2019, and the site fronts a public through road. There are numerous alternative access/egress routes and safe refuges, therefore it is considered there is appropriate operational access and egress for emergency services and occupants is available for a site in a low risk urban area.
PBP 2019 Sec 1.1 (objectives)	<i>provide for ongoing management and maintenance of BPMs;</i>		Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any BPMs, either on the site or on adjoining properties. Some informal precautionary measures are included in Sec 9. It has been determined that the site should not be considered as BFPL. There is no reason to assume the adjoining mitigating features detailed in Sec 8.1 and 12 will not managed

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			and maintained on an ongoing basis.
PBP 2019 Sec 1.1 (objectives)	<i>ensure that utility services are adequate to meet the needs of firefighters</i>		Considered to comply; the assessment revealed that the site may be considered not to be BFPL, therefore the provision of utilities as formal BPMs is not considered necessary. Some informal precautionary measures are included in Sec 9. Although there may be an issue with hydrant spacing as detailed in Sec 9.5, there are hydrants available in the area which given the low risk of bush fire to the site, is considered adequate to meet the needs of firefighters.
PBP 2019 Sec 4.1 (strategic principals)	<i>ensuring land is suitable for development in the context of bush fire risk;</i>		Complies; vegetation causing the site to be BFPL was found to meet the criteria in A1.10 of PBP 2019, therefore the site may be considered not BFPL and suitable for the proposed dual occupancy.
PBP 2019 Sec 4.1 (strategic principals)	<i>ensuring new development on BFPL will comply with PBP;</i>		Complies; as the nearest vegetation considered a hazard (plot 4) is >100m from the site, the site may be considered not BFPL, and the assessment reveals no requirement to comply with PBP 2019.
PBP 2019 Sec 4.1 (strategic principals)	<i>minimising reliance on performance-based solutions;</i>		Complies; there are no performance-based solutions proposed.
PBP 2019 Sec 4.1 (strategic principals)	<i>providing adequate infrastructure associated with emergency evacuation and firefighting operations; and</i>		Complies; as detailed in Sec 9, there were no constraints identified associated with emergency evacuation. Given the assessment revealed the site may be considered not BFPL, the potential compliance of

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			hydrant infrastructure detailed in Sec 9.5 may be considered not applicable. There are hydrants in the area together with reasonable access to surrounding properties and hazard vegetation.
PBP 2019 Sec 4.1 (strategic principals)	<i>facilitating appropriate ongoing land management practices.</i>		Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any BPMs, either on the site or on adjoining properties. Some informal precautionary measures are included in Sec 9. It has been determined that the site may not be considered as BFPL. There is no reason to assume the adjoining mitigating features detailed in Sec 8.1 and 12 will not managed and maintained on an ongoing basis.
PBP 2019 Sec 4.1 (exclusions)	<i>the development area is exposed to a high bush fire risk and should be avoided;</i>		Complies; the assessment revealed the development is exposed to a low bush fire risk and should be permitted.
PBP 2019 Sec 4.1 (exclusions)	<i>the development is likely to be difficult to evacuate during a bush fire due to its siting in the landscape, access limitations, fire history and/or size and scale;</i>		Complies; the development is not likely to be difficult to evacuate during a bush fire. The siting in the landscape is appropriate to facilitate the development, there are no access limitations, fire history is not detailed in the current <i>Bankstown / Hurstville Bush Fire Risk Management Plan (2013)</i> , and hazard management in Sec 8.1 and 12 shows a reduced level of risk. The increase in residential density is appropriate

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			considering the bush fire risk.
PBP 2019 Sec 4.1 (exclusions)	<i>the development will adversely effect other bush fire protection strategies or place existing development at increased risk;</i>		Complies; the proposed development will not adversely effect other bush fire protection strategies or place existing development at increased risk.
PBP 2019 Sec 4.1 (exclusions)	<i>the development is within an area of high bush fire risk where density of existing development may cause evacuation issues for both existing and new occupants;</i>		Complies; the development is not in an area of high risk and may be considered not to be BFPL. The existing road network providing multiple options for egress is adequate to cater for evacuation of existing development in the vicinity of the site. The proposed increase in residential density resulting from the dual occupancy is not considered to cause any evacuation issues.
PBP 2019 Sec 4.1 (exclusions)	<i>the development has environmental constraints to the area which cannot be overcome</i>		Complies; there were no environmental constraints identified.
PBP 2019 Sec 5.2 (objectives)	<i>minimise perimeters of the subdivision exposed to the bush fire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided);</i>		Complies; it has not been advised that any subdivision is proposed as part of the development, however the subdivision controls apply to dual occupancies. The existing subdivision pattern in the vicinity of the site does not conflict with these principals in such a way that the proposed development should be avoided. The site has direct access to a public through road.
PBP 2019 Sec 5.2 (objectives)	<i>minimise vegetated corridors that permit the passage of bush fire towards buildings;</i>		Complies; vegetation in plots 1, 2, and 3 were found to meet the criteria for low hazard vegetation exclusions in A1.10 of PBP 2019 and are unlikely to permit the passage of fire

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			from plot 4, which is located >100m from the site and plot 1. The 170m separation provided by the Georges River between plot 1 and vegetation to the southwest further prevents the fire spread to the site.
PBP 2019 Sec 5.2 (objectives)	<i>provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests;</i>		Complies; the site is not located in these high risk locations.
PBP 2019 Sec 5.2 (objectives)	<i>ensure that APZs between a bush fire hazard and future dwellings are effectively designed to address the relevant bush fire attack mechanisms;</i>		Complies; the assessment revealed that the site may be considered not BFPL, and the adjoining plot 1 is excluded from being a hazard pursuant to A1.10 of PBP 2019. The nearest hazard (plot 4) is >100m from the site, with the nearest mapped category 1 hazard located 120m from the site. There is insufficient bush fire risk to warrant any BPMs, including APZs.
PBP 2019 Sec 5.2 (objectives)	<i>ensure the ongoing maintenance of APZs;</i>		Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any APZs, either on the site or on adjoining properties. Some informal precautionary measures are included in Sec 9. It has been determined that the site may not be considered as BFPL. There is no reason to assume the adjoining mitigating features detailed in Sec 8.1 and 12 will not managed and maintained on an ongoing basis.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
PBP 2019 Sec 5.2 (objectives)	<i>provide adequate access from all properties to the wider road network for residents and emergency services;</i>		Complies; adequate access from the site to the wider road network for residents and emergency services for an urban area is provided.
PBP 2019 Sec 5.2 (objectives)	<i>provide access to hazard vegetation to facilitate bush fire mitigation works and fire suppression;</i>		Complies; access to vegetation in plot 1 is provided via the Sydney Water access driveway leading to the infrastructure in plot 1, and, from adjoining private lands including the site. Plot 3 is accessed from private lands or plot 1 or 4. Plot 4 is the vegetation assessed as a hazard; it is accessible and hazard reduction is included in the current <i>Bankstown / Hurstville Bush Fire Risk Management Plan (2013)</i> ; See Sec 12.
PBP 2019 Sec 5.2 (objectives)	<i>ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.</i>		Considered to comply; despite the details in Sec 9.5, the existing reticulated water infrastructure including street hydrants is considered adequate to supply water for firefighting, given the site may be considered not to be BFPL. There is insufficient bush fire risk to warrant specific BPMs.
PBP 2019 Table 5.3a (APZs)	<i>potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.</i>	<i>APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.</i>	Complies; the entire site is assessed as BAL-LOW due to the hazard (plot 4) being located >100m from the site, and all vegetation <100m of the site being excluded from being a hazard under A1.10 of PBP 2019.
PBP 2019 Table 5.3a (APZs)	<i>APZs are managed and maintained to prevent the spread of a fire towards the building.</i>	<i>APZs are managed in accordance with the requirements of Appendix 4</i>	Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			warrant formal recommendations for any BPMs, including APZs. Some informal precautionary measures are included in Sec 9. It has been determined that the site may not be considered as BFPL.
PBP 2019 Table 5.3a (APZs)	<i>the APZs is provided in perpetuity</i>	<i>APZs are wholly within the boundaries of the development site</i>	Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any APZs, either on the site or on adjoining properties. Some informal precautionary measures are included in Sec 9. It has been determined that the site may not be considered as BFPL. There is no reason to assume the adjoining mitigating features detailed in Sec 8.1 and 12 will not managed and maintained on an ongoing basis.
PBP 2019 Table 5.3a (APZs)	<i>APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.</i>	<i>APZs are located on lands with a slope less than 18 degrees.</i>	Complies; there are no APZs required or formally recommended. All land within 100m of the site is on slopes <18°.
PBP 2019 Table 5.3a (Landscaping)	<i>landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.</i>	<ul style="list-style-type: none"> <i>landscaping is in accordance with Appendix 4;</i> <i>fencing is constructed in accordance with section 7.6.</i> 	Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any BPMs, including landscaping. Some informal precautionary measures are included in Sec 9.
PBP 2019 Table 5.3b	<i>firefighting vehicles are provided with safe, all-</i>	<ul style="list-style-type: none"> <i>property access roads are two-wheel drive, all-weather roads;</i> 	Complies; safe, all-weather access to the site is provided for firefighting

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
(Access General)	<i>weather access to structures.</i>	<ul style="list-style-type: none"> <i>perimeter roads are provided for residential subdivisions of three or more allotments;</i> <i>subdivisions of three or more allotments have more than one access in and out of the development;</i> <i>traffic management devices are constructed to not prohibit access by emergency services vehicles;</i> <i>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;</i> <i>all roads are through roads;</i> <i>dead end roads are not recommended, but if unavoidable, 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;</i> <i>where kerb and guttering is provided on perimeter roads, roll top kerbing should be used to the hazard side of the road;</i> <i>where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an</i> 	<p>vehicles along the public road network. There are no requirements for access within the site as the site meets the criteria for an urban area.</p> <ul style="list-style-type: none"> Roads are 2WD all-weather roads, Perimeter roads are not provided in the existing subdivision pattern, however no further subdivision is proposed, and a perimeter road would not benefit the site in relation to plot 1, which has been excluded from being a hazard pursuant to A1.10 of PBP 2019, More than 1 access point is not required as there is no 3 lot subdivision or 3 dwellings proposed, Traffic management devices in the immediate vicinity of the site do not prohibit access for emergency services, Grades are <15°, There are numerous alternative access/egress options and safe refuges, There are no dead-end roads in the immediate vicinity >200m in length There are no 1-way roads.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
		<p><i>alternate point on the existing public road system;</i></p> <p><i>i. one way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.</i></p>	
PBP 2019 Table 5.3b (Access General)	<i>the capacity of access roads is adequate for firefighting vehicles.</i>	<ul style="list-style-type: none"> <i>the capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/causeways are to clearly indicate load rating.</i> 	Complies; the capacity of existing road surfaces is considered adequate to carry fully loaded firefighting vehicles. No load rating signage was observed. There are no bridges or causeways in the immediate vicinity of the site likely to impede firefighting vehicles.
PBP 2019 Table 5.3b (Access General)	<i>there is appropriate access to water supply.</i>	<ul style="list-style-type: none"> <i>hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression;</i> <i>hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 - Fire hydrant installations System design, installation and commissioning;</i> <i>there is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.</i> 	Complies; there is appropriate access to water supply given it is demonstrated that the site may be considered not to be BFPL. The street hydrant infrastructure is discussed in Sec 9.5, is not located in the road carriageway, and is considered adequate to allow emergency services to protect the proposed development and surrounding properties. A SWS is not required.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
PBP 2019 Table 5.3b (Access: non-perimeter roads)	<i>access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.</i>	<ul style="list-style-type: none"> <i>minimum 5.5m carriageway width kerb to kerb;</i> <i>parking is provided outside of the carriageway width;</i> <i>hydrants are located clear of parking areas;</i> <i>roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m;</i> <i>curves of roads have a minimum inner radius of 6m;</i> <i>the road crossfall does not exceed 3 degrees;</i> <ul style="list-style-type: none"> <i>a minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.</i> 	<p>Complies; the existing road carriageway of Henry Lawson Dr in the vicinity of the site is 7 metres wide. Parking is provided outside the road carriageway either off-street or in undesignated parking areas. This may impact access to hydrants, however the site may be considered not to be BFPL.</p> <p>Roads in the vicinity of the site are through roads, with alternative options at <500m intervals. There are no dead-end roads in the immediate vicinity >200m in length.</p> <p>Curves, grades and crossfalls appear to be compliant with the requirements of PBP 2019, despite the site being assessed as BAL-LOW and may be considered not BFPL.</p> <p>Any potential compliance issue with the existing road and hydrant network is not considered a sufficient reason for the proposed dual occupancy to be prohibited, nor to warrant any upgrading, given the site may be considered not BFPL.</p>
PBP 2019 Table 5.3b (Property access)	<i>firefighting vehicles can access the dwelling and exit the property safely</i>	<ul style="list-style-type: none"> <i>There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and</i> 	Complies; the farthest extent of the site is less than 70m from a public through road (Henry Lawson Dr), the site meets the criteria for an urban area for there to be no requirements for access,

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
		<i>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>	and, the site may be considered not to be BFPL.
PBP 2019 Table 5.3c (Water supplies)	<i>adequate water supplies is provided for firefighting purposes.</i>	<ul style="list-style-type: none"> • <i>reticulated water is to be provided to the development where available;</i> • <i>a static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed;</i> • <i>static water supplies shall comply with Table 5.3d.</i> 	Considered to comply; there is appropriate access to reticulated water supply given the site may be considered not BFPL. The street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow emergency services to protect the proposed development, adjoining properties and fire suppression within plot 1 should it be ignited from embers travelling >100m. A SWS is not required.
PBP 2019 Table 5.3c (Water supplies)	<ul style="list-style-type: none"> • <i>water supplies are located at regular intervals;</i> • <i>the water supply is accessible and reliable for firefighting operations.</i> 	<ul style="list-style-type: none"> • <i>fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005;</i> • <i>hydrants are not located within any road carriageway;</i> • <i>reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.</i> 	Considered to comply; there is appropriate access to water supply. The street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow emergency services to protect the proposed development, given the site may be considered not BFPL.
PBP 2019 Table 5.3c (Water supplies)	<ul style="list-style-type: none"> • <i>flows and pressure are appropriate.</i> 	<ul style="list-style-type: none"> • <i>fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.</i> 	Considered to comply; the street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow emergency services to protect the proposed development.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
PBP 2019 Table 5.3c (Water supplies)	<ul style="list-style-type: none"> <i>the integrity of the water supply is maintained.</i> 	<ul style="list-style-type: none"> <i>all above-ground water service pipes are metal, including and up to any taps;</i> <i>above-ground water storage tanks shall be of concrete or metal.</i> 	Complies; as the site may be considered not BFPL, formal BPMs for water supply are not included. Some informal precautionary measures are included in Sec 9.
PBP 2019 Table 5.3c (Electricity services)	<ul style="list-style-type: none"> <i>location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.</i> 	<ul style="list-style-type: none"> <i>where practicable, electrical transmission lines are underground;</i> <i>where overhead, electrical transmission lines are proposed as follows:</i> <ul style="list-style-type: none"> <i>lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas;</i> <i>no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.</i> 	Considered to comply; the existing above ground electrical connection for the site is considered adequate, given the site may be considered not BFPL.
PBP 2019 Table 5.3c (Gas services)	<ul style="list-style-type: none"> <i>location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.</i> 	<ul style="list-style-type: none"> <i>reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used;</i> <i>all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and</i> 	Complies; as the site may be considered not BFPL, formal BPMs for gas supply are not included. Some informal precautionary measures are included in Sec 9.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
		<p><i>shielded on the hazard side;</i></p> <ul style="list-style-type: none"> <i>connections to and from gas cylinders are metal;</i> <i>polymer-sheathed flexible gas supply lines are not used; and</i> <i>above-ground gas service pipes are metal, including and up to any outlets.</i> 	
PBP 2019 Table 5.3d (SWS)		<i>Multi-dwelling housing (including dual occupancies) require a SWS of 5,000L/dwelling</i>	N/A; there is no formal requirement for the site <1000sqm to have a SWS for firefighting, as reticulated water is available, and the site may be considered not BFPL.
PBP 2019 Sec 7.3 (objectives)	<ul style="list-style-type: none"> <i>provide a defensible space to enable unimpeded access for firefighting around the building;</i> 		Complies; it is anticipated that the development will be setback ≥900mm from the adjoining vegetation in plot 1 (which is considered a low threat vegetation exclusion under A1.10 PBP 2019). Sec 9.2 suggests marginally exceeding this. The adjoining plot 1 appears to have some form of hazard management occurring, increasing the defensible space.
PBP 2019 Sec 7.3 (objectives)	<ul style="list-style-type: none"> <i>provide better bush fire outcomes on a redevelopment site than currently exists, commensurate with the scale of works proposed;</i> 		Complies; given the site may be considered not BFPL, it is not considered warranted for the proposed development to provide better bush fire outcomes than currently exists, despite the increase in residential density.
PBP 2019 Sec 7.3 (objectives)	<ul style="list-style-type: none"> <i>design and construct buildings commensurate with the bush fire risk;</i> 		Complies; the entire site is assessed as BAL-LOW due to the hazard (plot 4) being located >100m from the site, and all vegetation <100m of the site being excluded from being a

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
			hazard under A1.10 of PBP 2019.
PBP 2019 Sec 7.3 (objectives)	<ul style="list-style-type: none"> provide access, services and landscaping to aid firefighting operations; 		Complies; it is demonstrated that access, services and landscaping need not aid firefighting operations, given the site may be considered not BFPL.
PBP 2019 Sec 7.3 (objectives)	<ul style="list-style-type: none"> not impose an increased bush fire management and maintenance responsibility on adjoining land owners; 		Complies; Sec 8.1 and 12 details there is already management occurring. There is no reason to assume that this level of management will not continue in future. The proposed development does not impose any additional burden on adjoining properties for management of vegetation than what currently occurs.
PBP 2019 Sec 7.3 (objectives)	<ul style="list-style-type: none"> increase the level of bush fire protection to existing dwellings based on the scale of the proposed work and level of bush fire risk. 		Complies; given the site may be considered not BFPL, the proposed development does not increase the level of protection to existing dwellings.
PBP 2019 Table 7.4a (APZ)	<ul style="list-style-type: none"> APZs are provided commensurate with the construction of the building; and, a defensible space is provided. 	an APZ is provided in accordance with Table A1.12.2 or A1.12.3 in Appendix 1.	Complies; the entire site is assessed as BAL-LOW due to the hazard (plot 4) being located >100m from the site, and all vegetation <100m of the site being excluded from being a hazard under A1.10 of PBP 2019. A defensible space is provided consistent with an urban area.
PBP 2019 Table 7.4a (APZ)	APZs are managed and maintained to prevent the spread of a fire to the building	APZs are managed in accordance with the requirements of Appendix 4 of PBP	Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any BPMs, including APZs. Some

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			informal precautionary measures are included in Sec 9. It has been determined that the site may not be considered as BFPL.
PBP 2019 Table 7.4a (APZ)	<i>the APZ is provided in perpetuity. APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.</i>	<ul style="list-style-type: none"> APZs are wholly within the boundaries of the development site. APZ are located on lands with a slope less than 18 degrees. 	Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any APZs, either on the site or on adjoining properties. It has been determined that the site may not be considered as BFPL. There is no reason to assume the adjoining mitigating features detailed in Sec 8.1 and 12 will not managed and maintained on an ongoing basis, which will continue to prevent crown fires.
PBP 2019 Table 7.4a (Access)	<i>firefighting vehicles are provided with safe, all-weather access to structures and hazard vegetation</i>	<ul style="list-style-type: none"> property access roads are two-wheel drive, all weather roads 	Complies; access to the site is via 2WD, all weather roads.
PBP 2019 Table 7.4a (Access)	<i>the capacity of access roads is adequate for firefighting vehicles</i>	<ul style="list-style-type: none"> the capacity of road surfaces and any bridges/ causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating; 	Complies; the capacity of existing road surfaces is considered adequate to carry fully loaded firefighting vehicles. There are no bridges or causeways in the multiple access/egress options in the vicinity of the site. Henry Lawson Dr is a major road suitable for heavy vehicles.
PBP 2019 Table 7.4a (Access)	<i>there is appropriate access to water supply</i>	<ul style="list-style-type: none"> hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005; There is suitable access for a Category 1 fire appliance to within 4m 	Considered to comply; there is appropriate access to water supply. The street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow emergency services to

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
		<i>of the static water supply where no reticulated supply is available.</i>	protect the proposed development, given the site may be considered not BFPL. A SWS is not required.
PBP 2019 Table 7.4a (Access)	<i>Firefighting vehicles can access the dwelling and exit the property safely</i>	<ul style="list-style-type: none"> <i>at least one alternative property access road is provided for individual dwellings or groups of dwellings that are located more than 200 metres from a public through road;</i> <i>There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided 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> 	Complies; the proposed development is within 200m of a public through road, no alternative access is required. An unobstructed path up to 70m is provided between the most distant part of the site and Henry Lawson Dr fronting the site. As the site may be considered not BFPL, and meets the criteria for an urban area, no access requirements apply.
PBP 2019 Table 7.4a (Water supplies)	<i>An adequate water supply is provided for firefighting purposes</i>	<ul style="list-style-type: none"> <i>reticulated water is to be provided to the development, where available; and</i> <i>a static water supply is provided where no reticulated water is available.</i> 	Considered to comply; the site is provided with reticulated water. Street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow emergency services to protect the proposed development. A SWS is not required.
PBP 2019 Table 7.4a (Water supplies)	<i>water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations.</i>	<ul style="list-style-type: none"> <i>fire hydrant spacing, design and sizing comply with the relevant clauses of AS 2419.1:2005;</i> <i>hydrants are not located within any road carriageway; and</i> 	Considered to comply; there is appropriate access to reticulated water supply given the site may be considered not BFPL. The street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
		<ul style="list-style-type: none"> <i>reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.</i> 	<p>emergency services to protect the proposed development.</p> <p>Hydrants are not within the road carriageway, and there are no perimeter roads requiring a ring main.</p>
PBP 2019 Table 7.4a (Water supplies)	<i>flows and pressures are appropriate</i>	<ul style="list-style-type: none"> <i>fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005.</i> 	Considered to comply; the street hydrant infrastructure is discussed in Sec 9.5 and is considered adequate to allow emergency services to protect the proposed development given the site may be considered not BFPL.
PBP 2019 Table 7.4a (Water supplies)	<i>the integrity of the water supply is maintained.</i>	<ul style="list-style-type: none"> <i>all above-ground water service pipes external to the building are metal, including and up to any taps.</i> 	Complies; as the site may be considered not BFPL, there are no formal recommendations included for water supplies. Some informal precautionary measures are included in Sec 9.
PBP 2019 Table 7.4a (Water supplies)	<i>a static water supply is provided for firefighting purposes in areas where reticulated water is not available.</i>	<ul style="list-style-type: none"> <i>where no reticulated water supply is available, water for firefighting purposes is provided in accordance with Table 5.3d;</i> <i>a connection for firefighting purposes is located within the IPA or non-hazard side and away from the structure; 65mm Storz outlet with a ball valve is fitted to the outlet;</i> <i>ball valve and pipes are adequate for water flow and are metal;</i> <i>supply pipes from tank to ball valve have the same bore size to ensure flow volume;</i> <i>underground tanks have an access hole of</i> 	N/A; the site is provided with reticulated water. No SWS is required.

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		<p>200mm to allow tankers to refill direct from the tank;</p> <ul style="list-style-type: none"> • a hardened ground surface for truck access is supplied within 4m; • above-ground tanks are manufactured from concrete or metal; • raised tanks have their stands constructed from non-combustible material or bush fire-resisting timber (see Appendix F of AS 3959); • unobstructed access can be provided at all times; • underground tanks are clearly marked; • tanks on the hazard side of a building are provided with adequate shielding for the protection of firefighters; • all exposed water pipes external to the building are metal, including any fittings; • where pumps are provided, they are a minimum 5hp or 3kW petrol or diesel-powered pump, and are shielded against bush fire attack; any hose and reel for firefighting connected to the pump shall be 19mm internal diameter; and • fire hose reels are constructed in accordance with AS/NZS 1221:1997, and installed in accordance with the 	

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		<i>relevant clauses of AS 2441:2005.</i>	
PBP 2019 Table 7.4a (Electricity services)	<i>location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.</i>	<ul style="list-style-type: none"> • <i>where practicable, electrical transmission lines are underground;</i> • <i>where overhead, electrical transmission lines are proposed as follows:</i> <ul style="list-style-type: none"> ○ <i>lines are installed with short pole spacing (30m), unless crossing gullies, gorges or riparian areas; and</i> ○ <i>no part of a tree is closer to a power line than the distance set out in accordance with the specifications in ISSC3 Guideline for Managing Vegetation Near Power Lines.</i> 	Considered to comply; the existing above ground electrical connection for the site is considered adequate, given the site may be considered not BFPL.
PBP 2019 Table 7.4a (Gas services)	<i>location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.</i>	<ul style="list-style-type: none"> • <i>reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 and the requirements of relevant authorities, and metal piping is used;</i> • <i>all fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side;</i> • <i>connections to and from gas cylinders are metal;</i> • <i>polymer-sheathed flexible gas supply lines are not used; and</i> • <i>above-ground gas service pipes are metal,</i> 	Complies; as the site may be considered not BFPL, formal BPMs for gas supply are not included. Some informal precautionary measures are included in Sec 9.

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		<i>including and up to any outlets.</i>	
PBP 2019 Table 7.4a (Construction)	<i>The proposed building can withstand bush fire attack in the form of embers, radiant heat and flame contact</i>	<ul style="list-style-type: none"> <i>BAL is determined in accordance with Table A1.12.5-A1.12.7; and</i> <i>construction provided in accordance with the NCC and as modified by Sec 7.5 (please see advice on construction in the flame zone).</i> 	Complies; the entire site has been assessed as BAL-LOW due to all vegetation plots <100m being low hazard vegetation exclusions under A1.10 of PBP 2019, and plot 4 being >100m from the site. There are no formal BPMs for construction required to satisfy PBP 2019, AS3959:2018 or the NCC. Some informal precautionary measures are included in Sec 9.
PBP 2019 Table 7.4a (Construction)	<i>Proposed fences and gates are designed to minimise the spread of bush fire</i>	<ul style="list-style-type: none"> <i>Fencing and gates are constructed in accordance with Sec 7.6</i> 	Complies; there are no formal requirements for fencing or gates as the site may be considered not BFPL. Some informal precautionary measures are included in Sec 9.
PBP 2019 Table 7.4a (Construction)	<i>Proposed Class 10a buildings are designed to minimise the spread of bush fire.</i>	<ul style="list-style-type: none"> <i>Class 10a buildings are constructed in accordance with Sec 8.3.2</i> 	Complies; there are no formal requirements for class 10a buildings as the site may be considered not BFPL.
PBP 2019 Table 7.4a (Landscaping)	<i>Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.</i>	<ul style="list-style-type: none"> <i>compliance with the NSW RFS 'Asset protection zone standards' (see Appendix 4);</i> <i>a clear area of low-cut lawn or pavement is maintained adjacent to the house;</i> <i>fencing is constructed in accordance with Sec 7.6; and</i> <i>trees and shrubs are located so that:</i> <ul style="list-style-type: none"> <i>the branches will not overhang the roof;</i> <i>the tree canopy is not</i> 	Complies; an assessment against the relevant provisions in PBP 2019 revealed there are no circumstances which warrant formal recommendations for any BPMs, including landscaping. Some informal precautionary measures are included in Sec 9.

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		<p><i>continuous; and</i></p> <ul style="list-style-type: none"> <i>any proposed windbreak is located on the elevation from which fires are likely to approach.</i> 	
PBP 2019 Sec 7.5.2 (NSW NCC variations)		<p><i>The following variations to AS 3959 apply in NSW for the purposes of NSW G5.2(a)(i) of Volume One and NSW 3.10.5.0(c)(i) of Volume Two of the NCC;</i></p> <ul style="list-style-type: none"> <i>clause 3.10 of AS 3959 is deleted and any sarking used for BAL-12.5, BAL-19, BAL-29 or BAL-40 shall:</i> <ul style="list-style-type: none"> <i>be non-combustible; or</i> <i>comply with AS/NZS 4200.1, be installed on the outside of the frame and have a flammability index of not more than 5 as determined by AS 1530.2; and</i> <i>clause 5.2 and 6.2 of AS 3959 is replaced by clause 7.2 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall requirements for the respective BAL; and</i> <i>clause 5.7 and 6.7 of AS 3959 is replaced by clause 7.7 of AS 3959, except that any wall enclosing the subfloor space need only comply with the wall</i> 	Complies; the entire site has been assessed as BAL-LOW due to all vegetation plots <100m being low hazard vegetation exclusions under A1.10 of PBP 2019, and plot 4 being >100m from the site. There are no formal BPMs for construction required to satisfy PBP 2019 or the NCC. Some informal precautionary measures are included in Sec 9.

Document reference	Performance criteria / element	Acceptable solutions	Compliance/comment
		<i>requirements for the respective BAL</i>	
PBP 2019 Sec 7.6 (Fences and gates)		<p><i>Fences and gates in bush fire prone areas may play a significant role in the vulnerability of structures during bush fires. In this regard, all fences in bush fire prone areas should be made of either hardwood or non-combustible material.</i></p> <p><i>However, in circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.</i></p>	Complies; there are no formal requirements for fencing or gates as the site may be considered not BFPL. Some informal precautionary measures are included in Sec 9.
PBP 2019 Sec 8.2.1 (increased residential densities)	<p><i>In some situations increased densities may not be appropriate having regard to the strategic principles (see section 4.1), even though zoning has been approved for the proposed use. A Bush Fire Strategic Study may be required for these proposals as part of the broader BFDB process.</i></p> <p><i>Increased resident densities of existing lots that are bush fire prone may heighten the level of risk to the occupants. The presence of additional dwellings can impact on the evacuation and sheltering of residents during a bush fire.</i></p> <p><i>Where a new dwelling or dwellings are</i></p>	<p><i>This increase in residential density does not necessarily require a subdivision approval. However, the same principles and criteria associated with subdivisions in bush fire prone areas will apply. This includes ensuring an APZ based on a radiant heat threshold of 29kW/m² for any new dwellings, along with suitable provision for construction, access, water and landscaping.</i></p> <p><i>Where there is an existing dwelling within the subject site and a second building can otherwise comply with the provisions of this document, it may be necessary to upgrade the existing dwelling to provide:</i></p> <ul style="list-style-type: none"> <i>ember protection;</i> <i>improved water availability;</i> <i>suitable access; and</i> 	<p>Complies; all relevant provisions for the proposed increase in residential density are listed and assessed within this Appendix, and were found to be suitably compliant.</p> <p>The level of risk to occupants, and the impact on evacuation and sheltering of residents during a bush fire is not considered heightened to unacceptable levels. The zoning is approved for the proposed use, and the proposed development is considered appropriate having regard to the following requirements of PBP 2019:</p> <ul style="list-style-type: none"> The aims and objectives in Sec 1.1, The strategic principals in Sec 4.1, Specific objectives in Sec 5.2, BPMs in Table 5.3a-5.3d,

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	<p><i>proposed on existing lots which already contain one or more dwellings, this is considered to be an increase in residential density and can include the following:</i></p> <ul style="list-style-type: none"> • <i>dual occupancy;</i> • <i>multi-dwelling housing;</i> • <i>secondary dwellings;</i> • <i>rural workers dwellings; and boarding houses.</i> 	<ul style="list-style-type: none"> • APZs. 	<ul style="list-style-type: none"> • Specific objectives in Sec 7.3, • BPMs in Table 7.4a, • NSW variations to the NCC in Sec 7.5.2, • Fences and gates in Sec 7.6, • Increased residential densities in Sec 8.2.1. <p>This report serves as a basic and adequate Bush Fire Strategic Study and establishes a low level of bush fire risk in that the site can be considered not BFPL. A BFDB process was not considered necessary given the level of risk, the scale of the proposed development, and that no performance-based solutions are proposed.</p>