

Bushfire Strategic Study

West Gables Rezoning

Prepared for
Allam Homes and Stockland



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Glossary

This section defines those core terms and concepts which are adopted throughout the body of this report.

Term	Definition
Asset Protection Zone (APZ)	A fuel-reduced area surrounding a built asset or structure which provides a buffer zone between a bushfire hazard and an asset. The APZ includes a defendable space within which firefighting operations can be carried out. The size of the required APZ varies with slope, vegetation and FFDI.
Bushfire	A general term used to describe fire in vegetation, includes grass fire.
Bushfire attack mechanisms	The various ways in which a bushfire can impact upon people and property and cause loss or damage. These mechanisms include flame contact, radiant heat exposure, ember attack, fire wind and smoke.
Bushfire Attack Level (BAL)	A means of measuring the severity of a building's potential exposure to ember attack, radiant heat, and direct flame contact. The BAL is used as the basis for establishing the requirements for construction to improve protection of building elements and to articulate bushfire risk.
Bushfire Design Requirements	A separate (Attachment 17) design document to assist the master planning with requirements and specifications to provide compliance with PBP 2019.
Bushfire prone land (BPL)	An area of land that can support a bushfire or is likely to be subject to bushfire attack, as designated on a bushfire prone land map.
Bushfire Hazard	Any vegetation that has the potential to threaten lives, property, or the environment.

Bushfire Strategic Study (SBS)	Provides the opportunity to assess whether new development is appropriate in the bushfire hazard context.
Bushfire Threat	Potential bushfire exposure of an asset due to the proximity and type of a hazard and the slope on which the hazard is situated.
Hazard	A hazard is any source of potential harm or a situation with a potential to cause loss. A hazard is therefore the source of risk.
Likelihood	The chance of an event occurring. Likelihood may be represented as a statistical probability (such as an annual exceedance probability), or whether this is not possible, it can be represented qualitatively using measures such as 'likely', 'possible' and 'rare'.
Managed land	Land that has vegetation removed or maintained to a level that limits the spread and impact of bushfire. This may include developed land (residential, commercial, or industrial), roads, golf course fairways, playgrounds, sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries. Most common will be gardens and lawns within curtilage of buildings. These areas are managed to meet the requirements of an APZ.
Mitigation	The lessening or minimizing of the adverse impacts of a bushfire event. The adverse impacts of bushfire cannot be prevented fully, but their scale or severity can be substantially lessened by various strategies and actions. Mitigation measures include engineering techniques, retrofitting and hazard-resistant construction as well as on ground works to manage fuel and separate assets from bushland.
Planning for Bushfire Protection 2019 (PBP)	NSW Rural Fire Service publication effective from 1 March 2020 which is applicable to all new development on bushfire prone land in NSW.

Resilience	The ability of a system, community or society exposed to hazards to resist, absorb, accommodate, adapt to, transform and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions through risk management. UNDRR 2017
Risk	The degree of risk presented by that interaction will depend on the likelihood and consequence of the bushfire occurring. Risk may be defined as the chance of something happening, in a specified period of time that will have an impact on objectives. It is measured in terms of consequences and likelihood.
Risk assessment	A systematic process of evaluating the potential risks that may be involved in a projected activity or undertaking, having regard to factors of likelihood, consequence, vulnerability, and tolerability.
Risk-based land use planning	The strategic consideration of natural hazard risk and mitigation in informing strategic land use planning activities.

Executive Summary

Blackash Bushfire Consulting has prepared a Strategic Bushfire Study (SBS) to support the rezoning of various lots at Old Pitt Town and Boundary Roads, NSW.

The site is on Bushfire Prone Land and the Planning Proposal must satisfy the bushfire requirements within the *Environmental Planning and Assessment Act, 1979* (EPA Act), specifically Direction 4.4 *Planning for Bush Fire Protection*.

This Strategic Bushfire Study considers the suitability of the Planning Proposal with respect to bushfire risk. The Planning Proposal provides a well-considered design that as appropriate in the context of the low bushfire risk affecting the site and the aim and subsequent requirements within PBP to provide for the protection of life and the minimisation of impact on property while having due regard to the development potential, site characteristics and protection of the environment.

The proposed residential subdivision zoning has been assessed against PBP Chapter 5 – Residential and Rural Residential Subdivisions to satisfy the requirements of Section 4.4.1 regarding indicative development layout. The proposed development can satisfy the detailed criteria to be assessed at the next stage of the process.

The Planning Proposal is a suitable use of the land, and the bushfire protection measures demonstrated in this report comply with the Aim and Objectives of Planning for Bush Fire Protection 2019, the Ministerial Direction 4.4 Planning for Bush Fire Protection, and allow for the issue of a Gateway Determination with respect to bushfire matters.

1. Introduction

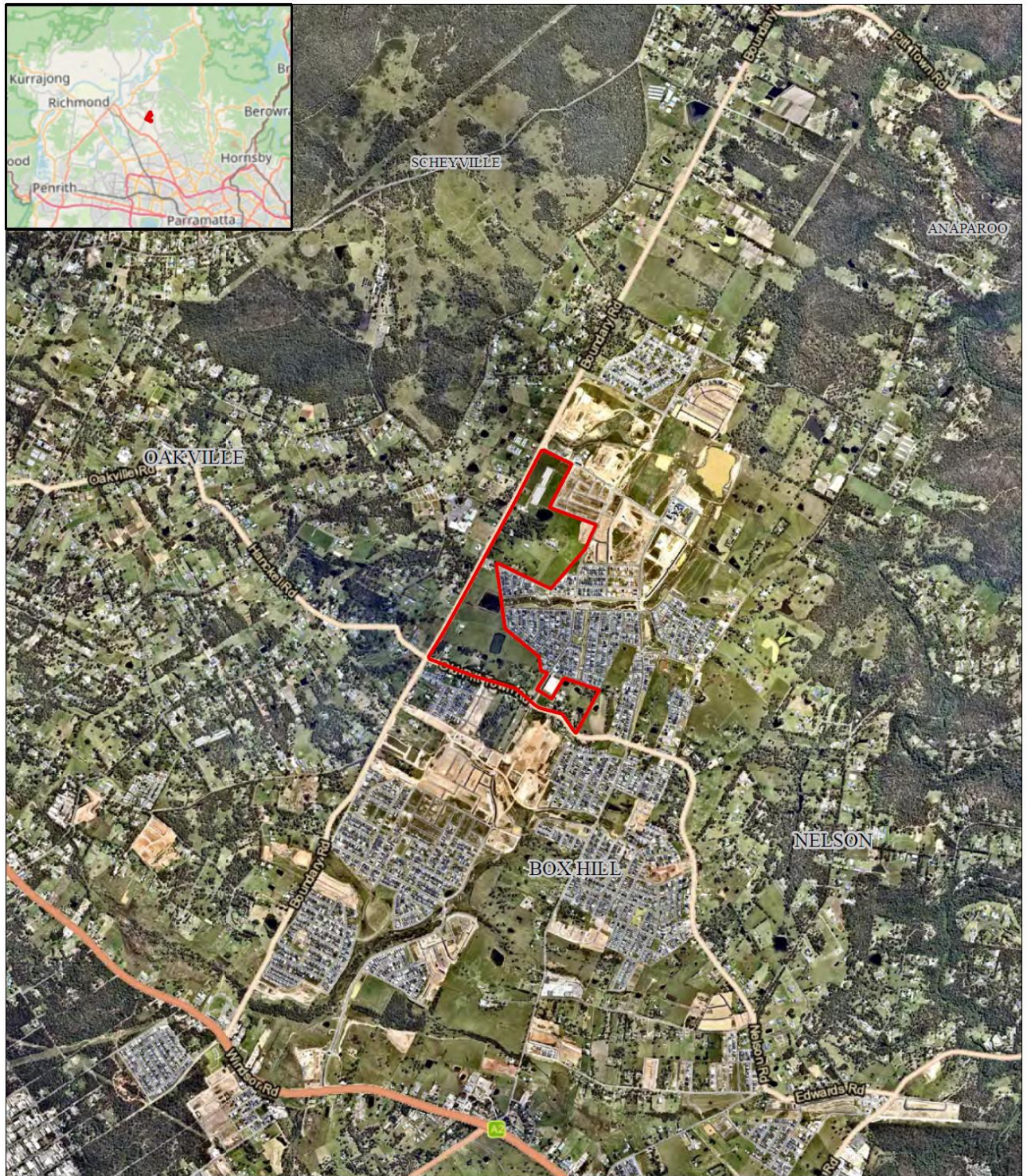
Blackash Bushfire Consulting has been engaged by Allam Homes and Stockland, to provide a Strategic Bushfire Study (SBS) to support the rezoning of various lots at Old Pitt Town and Boundary Roads, NSW (Figure 1). The Concept Plan is at Figure 2 and the Planning Proposal seeks to change the existing zoning to support such a residential development.

The site is on Bushfire Prone Land (BPL). The Planning Proposal has been designed to meet the bushfire requirements within the *Environmental Planning and Assessment Act, 1979* (EPA Act), specifically Direction 4.4 *Planning for Bush Fire Protection* which applies to Planning Proposals that affect, or are near, land mapped as BPL. This report demonstrates compliance with the NSW Rural Fire Service (RFS) document *Planning for Bushfire Protection 2019* (PBP).

The subject site is bisected by a drainage line and associated dam, it abuts the existing farmland to the west and residential development to the north, east and south. Boundary Road forms the western boundary, while Old Pitt Town Road forms the southern boundary. The area surrounding the site is extensively developed, modified or managed. Large fire runs cannot penetrate the site.

Small areas of remnant bushland will be retained/revegetated within the site and along the riparian corridor. While not a significant risk, they will be provided with appropriate APZ as per PBP 2019.

The site has been previously used for rural purposes. The site has been extensively cleared. The existing vegetation within the site is a mixture of cleared grassland and scattered pockets of remnant woodland.



Legend

Subject Land



Date: 30/06/2022

0 0.5 1 2
Kilometers

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

Figure 1: Location at The Gables

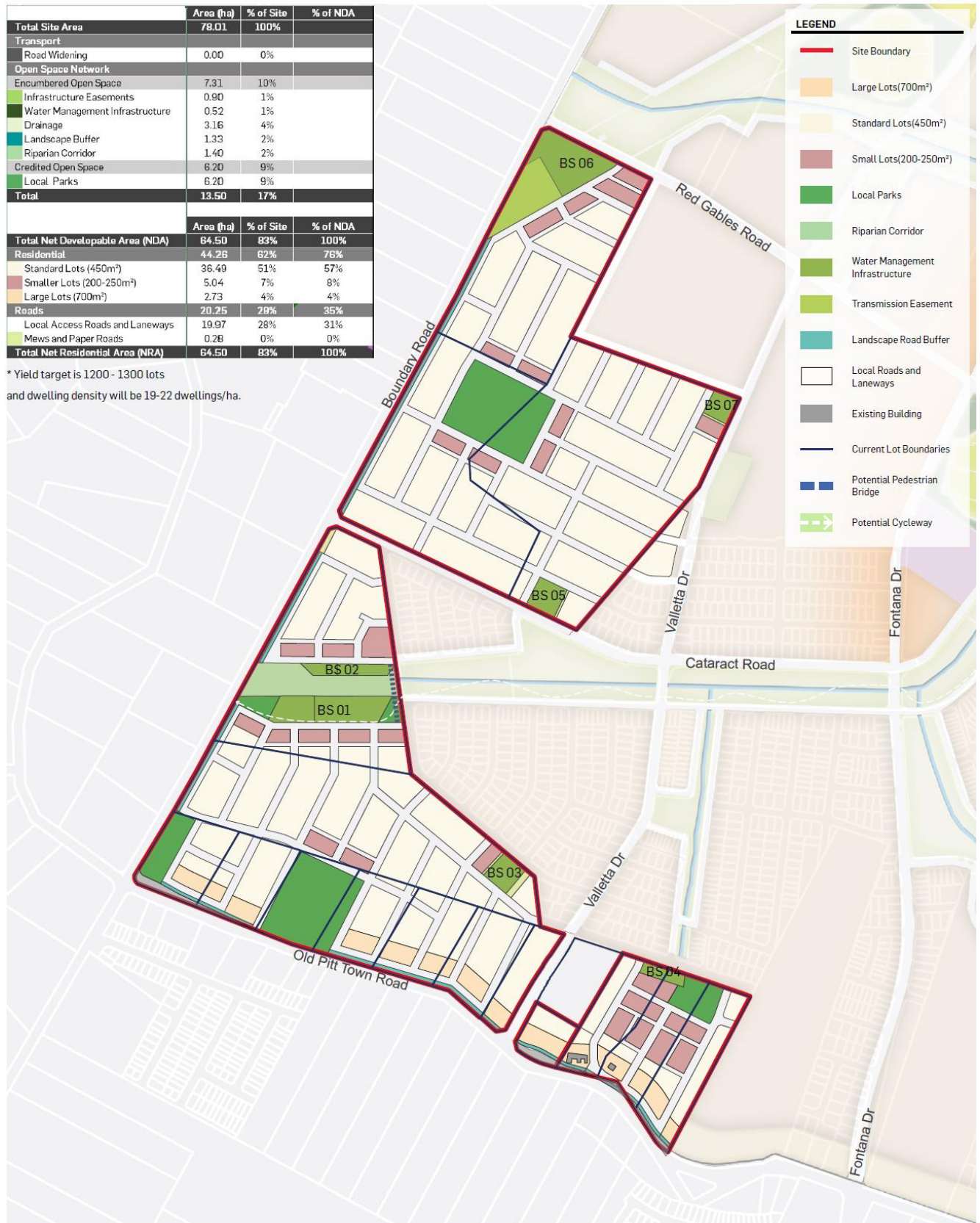


Figure 2: Proposal concept plan

2. Compliance Approach

The Planning Proposal and design of the site meets the deemed to satisfy requirements of PBP. No alternative solutions or performance-based assessment have been undertaken or relied upon for any part of this assessment.

The strategic planning process provides the opportunity to determine if the site complies with the legislative requirements pertaining to safety and potential risk to life and the capability of the site to comply with various bushfire objectives. This report uses a conservative approach that demonstrates the proposal can meet the legislative and planning requirements. The fundamental issue being tested in this rezoning application, is the determination of the suitability of the site for rezoning, considering bushfire safety and for the ability of future development to comply with PBP.

Pending approval, detailed information will be provided in subsequent development applications. This application provides opportunity for the consent authority and referral agencies to flag areas of concern and to determine the suitability of the proposal for rezoning.

In a bushfire context, strategic land use planning must ensure that future land uses are in appropriate locations to minimise the risk to life and property from bushfire attack. The broad principles which apply to the analysis, and which are demonstrated in this report are¹:

- ensuring land is suitable for development in the context of bushfire risk and broader environmental impacts
- ensuring new development on BPL will comply with the minimum requirements of PBP
- minimising reliance on performance-based solutions
- providing adequate infrastructure associated with emergency evacuation and firefighting operations
- facilitating appropriate ongoing land management practices.

This report will demonstrate that the Planning Proposal affords utilisation of the site for the proposed residential subdivision that is able to meet the acceptable solutions of PBP.

¹ Planning for Bushfire Protection 2019 p. 34

3. Strategic Planning for Bushfires

Land use planning is widely recognised as an important measure for limiting future vulnerabilities and losses in areas of new development and a critical element for building disaster resilient communities.

The physical design and layout of communities and settlements are central to the many functions that sustain the social, economic and environmental support systems for the community. Land use planning provides the opportunity to manage new growth and residual risk resulting from new development by complying with legislation and standards, limiting or modifying the location of new development and influencing its layout. This can limit both the impacts of new development on natural systems, ecosystem services and hazards and the flow on impacts on the existing community, as well as limiting the impacts that natural hazards can have on new development and its users.

The strategic planning system is particularly important in contributing to the creation of resilient, safe and sustainable communities that are in keeping with the policy and intent of government.

The *National Strategy for Disaster Resilience* (2011)² recognises that strategic planning is essential in creating safer and sustainable communities. In keeping with the policy and intent of government at all levels. Priority outcomes of Section 3.6 include:

- *All levels of decision making in land use planning and building control systems take into account information on risks to the social, built, economic and natural environments.*

This SBS has been completed having regard to the following Commonwealth documents:

- *National Strategy for Disaster Resilience* (2011)
- *Land Use Planning for Disaster Resilient Communities* (2020)
- *National Disaster Risk Reduction Framework* (2018)

Comprehensive consideration of bushfires and risks in the NSW planning system needs sound understanding of the landscape context and risks, as well as clarity on risk management

² NSDR <https://www.homeaffairs.gov.au/emergency/files/national-strategy-disaster-resilience.pdf>

principles and on the approach to strategic planning and development controls that will adequately mitigate identified risks. Where there are competing policy objectives, such as biodiversity conservation and fuel reduction, an agreed methodology or guidance is critical.

As such, planning decisions must be based on the best available evidence and rigorous merits-based assessment to ensure that new development - people, homes and businesses are not exposed to unacceptable risk from bushfire. The framework provided within PBP provides the minimum requirements for new development within bushfire prone areas.

Improved land use planning decisions and building controls for developments in bushfire prone areas are intrinsic to an integrated approach to the fire management in NSW. The application of legislation, policy, and guidelines provides one of the most effective means of bushfire planning to ensure future developments are resilient and capable of protecting life.

The importance of sound land use planning has been recognised in most significant bushfire inquiries, including Natural Disasters in Australia which noted that land use planning that considers natural hazard risks is the single most important mitigation measure in preventing future disaster losses in areas of new development, and that planning, and development controls must be effective, to ensure that inappropriate developments do not occur³.

This report focuses on disaster resilience which means planners, hazard leaders, emergency managers and other built environment professionals can contribute to:

- understanding and anticipating bushfire risks before they happen and developing more resilient land use and built form tailored to address bushfire risks
- minimising the increase in risks to people and disruptions to social and economic functions when a disaster strikes by ensuring compliance with state requirements for new development in Bushfire Prone Areas

This report recognises the balanced approach provided within NSW for new development in Bush Fire Prone Areas that recognises the need to protect human life, provide safe operating environment for fire and emergency services while having due regard to the environmental impacts, development potential of land and the need to cater for growing populations is provided in this assessment.

³ Ellis, S et al (2004) National Inquiry on Bushfire Mitigation and Management (p.92)

4. Legislative Framework

The landuse planning framework as it relates to landuse planning and bushfire in NSW is embedded in the EP&A Act, the *Rural Fires Act 1997* (RF Act), *Rural Fires Regulation 2013* (RFR) which is articulated through PBP.

4.1. Bushfire Prone Land

The study area is identified as being within 'bushfire prone land' (see Figure 3) for the purposes of Section 10.3 of the EPA Act and the legislative requirements for development on BPL are applicable.

Bushfire Prone Land Maps (BPLM) provide a trigger for the development assessment provisions and consideration of sites that are bushfire prone. BPL is land that has been identified by council, which can support a bushfire or is subject to bushfire attack. The BPLM are prepared by local council and certified by the Commissioner of the NSW RFS.

BPLM map vegetation hazards and provide a suitable buffer distance from that vegetation. They are an indication of potential bushfire attack only and are not a risk assessment of land.

The Hills Shire Council BPLM is considered to conservatively identify land that is capable of sustaining a bushfire and areas that may be subject to bushfire attack. The map shows the site is affected by Category 3 (Grassland) vegetation and associated buffer to the west, while small areas of Category 2 (low risk) vegetation exist to the north. The buffers are within the areas of established cleared and managed lands.

The Grassland area to the west is broken up by dwellings, sheds, roads and managed paddocks and does not present a continuous bushfire hazard as the BPLM reflects. Land to the north, east and south is all residential development with isolated pockets of riparian vegetation within narrow corridors.



Legend

- Watercourse
- Subject Land
- Cadastre
- Vegetation Category 2
- Vegetation Category 3
- Bushfire Prone Land**
- Vegetation Buffer
- Vegetation Category 1



Date: 30/06/2022

0 125 250 500
Metres
Coordinate System: GDA 1994 MGA Zone 56
Imagery: © Nearmap

Figure 3: Bushfire Prone Land Map

4.2. Strategic Planning Phase

The EP&A Act sets out the laws under which planning in NSW takes place. The main parts of the EP&A Act that relate to development assessment and approval are Part 3 (Planning Instruments) and Part 4 (Development Assessment).

EP&A Act Section 9.1 provides for the Planning Minister to direct councils to apply certain standards (detailed in the Direction) when preparing Planning Proposals for consideration. These Directions cover a range of practice areas and carry legislative weight.

Planning Direction 4.4 *Planning for Bush Fire Protection* (Appendix 3) requires Council to consult with the Commissioner of the NSW Rural Fire Service when preparing a Planning Proposal and consider any comments made. Importantly, a Planning Proposal must:

- (a) have regard to Planning for Bush Fire Protection 2019*
- (b) introduce controls that avoid placing inappropriate developments in hazardous areas, and*
- (c) ensure that bushfire hazard reduction is not prohibited within the APZ.*

Chapter 4 of PBP controls Strategic Planning, and details what must be included in an SBS. The SBS must be considered by Council, before any Planning Proposal to amend an LEP can be submitted to the Department of Planning, Industry & Environment (DPIE). The SBS will be considered by DPIE as part of the Gateway Determination. This determines whether the Planning Proposal should proceed further, or not, towards becoming an Environmental Planning Instrument (EPI).

EPIs are statutory plans made under Part 3 of the EP&A Act that guide development and land use. These plans include State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs). LEPs zone land and provide controls for a suitable range of permissible uses to be considered in more detail at the development assessment stage.

4.3. Development Assessment

Bushfire Prone Land (BPL) is designated in accordance with s.10.3 of the EP&A Act. BPL is land which can support a bushfire or is subject to bushfire attack, that has been identified and mapped by the local council and certified by the Commissioner of the RFS.

Integrated development, under Division 4.8 of the EP&A Act, is development requiring consent and one or more additional approvals. Section 4.46 of the EP&A Act requires a Bushfire Safety

Authority (BSA) from the RFS under Section 100B of the RFA for residential and rural residential subdivision, or development of land for a Special Fire Protection Purpose (SFPP) on BPL. An application for a BFSa must address the extent to which the development complies with PBP.

A BFSa authorises development to the extent that it complies with PBP including requirements for Asset Protection Zones (APZ), construction standards, landscaping, provision of water supply & utilities, access, and emergency management arrangements in combination considered by the Commissioner necessary to protect persons, property or the environment from danger that may arise from a bushfire.

New residential or rural residential subdivision development needs to justify that the Planning Proposal results in development that can achieve a worst-case Bushfire Attack Level (BAL) of a maximum of BAL-29.

Building work on BPL must comply with the requirements of the *National Construction Code* (NCC). Under the Deemed to Satisfy provisions of the NCC, building work on BPL must comply with Australian Standard 3959-2018 *Construction of buildings in bushfire-prone areas* (AS 3959) or the National Association of Steel Framed Housing (2014) *Steel Framed Construction in Bushfire Areas* (NASH Standard).

4.4. General Obligations

All owners and land managers (both public and private) have a duty to prevent the occurrence and spread of bushfires on or from their land. This duty is legislated under Section 63 of the RFA.

Local risk mitigation is coordinated through Bushfire Risk Management Plans (BRMP). These guide programs to implement specific treatments. Treatments may include such things as hazard reduction burning, establishing and maintaining APZ, grazing, preparing pre-incident plans, establishing and maintaining fire trails and community engagement. These may be applied to public and private landowners and as notified steps carry the legislative weight of Section 63.

5. Planning for Bush Fire Protection 2019

The specific objective of this SBS is to assess the proposed development with the strategic assessment considerations in Chapter 4 of PBP. The SBS provides the opportunity to assess whether new development is appropriate in the bushfire hazard context at a strategic or landscape scale. It also provides the ability to assess the strategic implications of future development for bushfire mitigation and management. The SBS must first demonstrate the proposal complies with the overall Aim and Objectives of the document.

All new development on bushfire prone land must comply with PBP.

The **aim** of PBP (p. 10) is:

- *to provide for the protection of human life and minimise impacts on property from the threat of bushfire, while having due regard to development potential, site characteristics and protection of the environment.*

The **objectives** (PBP p. 10) are to:

- *Afford buildings and their occupants protection from exposure to a bushfire*
- *Provide for a defensible space to be located around buildings*
- *Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings*
- *Ensure that appropriate operational access and egress for emergency service personnel and occupants is available*
- *Provide for ongoing management and maintenance of Bushfire Protection Measures; and*
- *Ensure that utility services are adequate to meet the needs of firefighters*

Chapter 4 of PBP articulates the regulatory framework for Planning Proposals in NSW, along with a series of assessment considerations that are required before a determination can be made regarding a Planning Proposal.

PBP Section 4.2 (in part, p. 34):

A Strategic Bush Fire Study must include, as a minimum, the components in Table 4.2.1.

Once these strategic issues have been addressed, an assessment of whether the proposal can comply with this document should be carried out. If the strategic issues cannot be resolved, then the proposal cannot comply with PBP and will not be supported by the NSW RFS.

Where the RFS do not support a Planning Proposal it is highly unlikely to progress further because of the Ministerial Direction 4.4 discussed previously.

Strategic planning will need to take account of the next level of detail required at Development Application (DA), but without needing to provide complete final project plans, or full assessments for each lot or development proposed. This is designed to provide flexibility for later project stages while progressing the rezoning to permit the new uses.

To achieve compliance with PBP at DA stage, proposals must comply with either the acceptable solutions or the performance criteria, or a combination of both. While PBP is a performance-based document, the RFS have determined minimum standards for new development (PBP p. 26 and within each performance criteria – p. 43-48 for residential subdivision and p. 55 -61 for SFPP development).

- *For new residential development, potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot (calculated on a flame temperature of 1090 Kelvin); and*
- *SFPP developments, radiant heat levels of greater than 10kW/m² (calculated at flame temperature of 1200K) will not be experienced on any part of the building.*

Some dispensations are provided for specific types of SFPP development such as camping, bed and breakfast/ farm stay, ecotourism, and manufactured home estates (PBP p. 55). Commercial, industrial, and “other” development must meet the aim and objectives of PBP.

5.1. Strategic Planning Compliance

PBP requires that Planning Proposals in bushfire prone areas require the preparation of a SBS. This SBS has been completed using the deemed to satisfy provisions within PBP. For strategic level assessment, this requirement relies on the application providing complying asset protection zones (APZ) for the proposed development, roads and access provisions and the provision of services (water, electricity and gas) that are able to meet PBP.

The SBS is a strategic level assessment, requiring a balance between providing sufficient information to determine the suitability of the site, without overly burdening proponents with detail to be managed / finalised at subsequent DA stage. PBP (p. 19) notes that:

The most important objective for strategic planning is to identify whether new development is appropriate subject to the identified bushfire risk on a landscape scale. An assessment of proposed land uses and potential for development to impact on existing infrastructure is also a key element of the strategic planning process in bushfire prone areas. Land use planning policies can be introduced to limit the number of people exposed to unacceptable risk.

Once development has been assessed as being appropriate in its bush fire prone context, it will need to be capable of complying with PBP. The ability of proposed land uses and associated future developments to comply with PBP will be assessed at the strategic planning stage. The expectation will be that the development will be able to comply with PBP at the DA stage.

The design team has considered and responded to the bushfire requirements within PBP. In a bushfire context, the design team has provided a Planning Proposal that ensures future residential lots are capable of being subdivided that are in appropriate locations to minimise the risk to life and property from bushfire attack. Future development will be able to comply with PBP at the DA stage.

The design team has incorporated the broad principles PBP (p. 34) for strategic planning into the Planning Proposal which apply to the risk assessment of an area which includes:

- *ensuring land is suitable for development in the context of bushfire risk*
- *ensuring new development on BPL will comply with PBP*
- *minimising reliance on performance-based solutions*
- *providing adequate infrastructure associated with emergency evacuation and firefighting operations*
- *facilitating appropriate ongoing land management practices.*

PBP also outlines exclusion of inappropriate development in bushfire prone areas which includes:

- *the development area is exposed to a high bushfire risk and should be avoided*
- *the development is likely to be difficult to evacuate during a bushfire due to its siting in the landscape, access limitations, fire history and/or size and scale*
- *the development will adversely effect other bushfire protection strategies or place existing development at increased risk*
- *the development is within an area of high bushfire risk where density of existing development may cause evacuation issues for both existing and new occupants*
- *the development has environmental constraints to the area which cannot be overcome.*

PBP requires that the SBS must include, as a minimum, the components identified in Table 4.2.1 of PBP – Bushfire Strategic Study (p.35) as shown in Figure 4.

ISSUE	DETAIL	ASSESSMENT CONSIDERATIONS
Bush fire landscape assessment	A bush fire landscape assessment considers the likelihood of a bush fire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape.	<ul style="list-style-type: none"> ➤ The bush fire hazard in the surrounding area, including: <ul style="list-style-type: none"> ➤ Vegetation ➤ Topography ➤ Weather ➤ The potential fire behaviour that might be generated based on the above; ➤ Any history of bush fire in the area; ➤ Potential fire runs into the site and the intensity of such fire runs; and ➤ The difficulty in accessing and suppressing a fire, the continuity of bush fire hazards or the fragmentation of landscape fuels and the complexity of the associated terrain.
Land use assessment	The land use assessment will identify the most appropriate locations within the masterplan area or site layout for the proposed land uses.	<ul style="list-style-type: none"> ➤ The risk profile of different areas of the development layout based on the above landscape study; ➤ The proposed land use zones and permitted uses; ➤ The most appropriate siting of different land uses based on risk profiles within the site (i.e. not locating development on ridge tops, SFPP development to be located in lower risk areas of the site); and ➤ The impact of the siting of these uses on APZ provision.
Access and egress	A study of the existing and proposed road networks both within and external to the masterplan area or site layout.	<ul style="list-style-type: none"> ➤ The capacity for the proposed road network to deal with evacuating residents and responding emergency services, based on the existing and proposed community profile; ➤ The location of key access routes and direction of travel; and ➤ The potential for development to be isolated in the event of a bush fire.
Emergency services	An assessment of the future impact of new development on emergency services.	<ul style="list-style-type: none"> ➤ Consideration of the increase in demand for emergency services responding to a bush fire emergency including the need for new stations/brigades; and ➤ Impact on the ability of emergency services to carry out fire suppression in a bush fire emergency.
Infrastructure	An assessment of the issues associated with infrastructure and utilities.	<ul style="list-style-type: none"> ➤ The ability of the reticulated water system to deal with a major bush fire event in terms of pressures, flows, and spacing of hydrants; and ➤ Life safety issues associated with fire and proximity to high voltage power lines, natural gas supply lines etc.
Adjoining land	The impact of new development on adjoining landowners and their ability to undertake bush fire management.	<ul style="list-style-type: none"> ➤ Consideration of the implications of a change in land use on adjoining land including increased pressure on BPMs through the implementation of Bush Fire Management Plans.

Figure 4: Requirements of a Bush Fire Strategic Study (PBP p. 35)

6. Bushfire Landscape Assessment

The bushfire landscape assessment considers the likelihood of a bushfire, its potential severity and intensity and the potential impact on life and property in the context of the broader surrounding landscape. The broader landscape and the potential size or scale of a bushfire has been a key design response by the project team throughout the preparation of the Planning Proposal.

6.1. Bushfire Hazard

PBP provides a methodology to determine the bushfire threat and commensurate size of any Asset Protection Zone (APZ) that may be required to offset possible bushfire attack. These elements include the potential hazardous landscape that may affect the site and the effective slope within that hazardous vegetation. For new residential subdivision development, APZ requirements are based on providing practical building envelopes on lots that keep radiant heat levels at future buildings below 29kW/m².

The following assessment is prepared in accordance with Section 100B of the RFA, Section 44 of the *Rural Fires Regulation 2013* (RFR) and PBP. This assessment is based on the following resources:

- Planning for Bush Fire Protection (RFS, 2019);
- The Hills Shire Council Bush Fire Prone Land Map;
- Aerial mapping; and
- Detailed GIS and Site analysis.

The methodology used in this assessment is in accordance with PBP (p.80) and is outlined in the following sections.

6.2. Fire Danger Weather District

PBP requires a credible worst case bushfire weather scenario at a 1:50 year bushfire weather event. The Hills Shire is in the Greater Sydney Fire Weather District in NSW and has a FFDI of 100. The relevant acceptable solution for residential development in PBP is provided by Table A1.12.2 (p. 90).

6.3. Vegetation Assessment

Vegetation is the fundamental physical component of determining the bushfire behaviour. Vegetation, in broad terms provides the available fuel to be consumed by a bushfire. Fuel load and arrangement represents a considerable component in dictating to a large degree

the behaviour of fire in terms of intensity, rate of spread and flame height, and typically relates to dead plant material less than 6mm thick, and live plant material thinner than 3mm.

Vegetation type, density and arrangement can further influence fire behaviour and intensity. Vertical and horizontal continuity is also a significant element. Thus, vegetation forms a key consideration within this report. The vegetation provides a basis for the determination for bushfire intensity mapping.

The vegetation assessment has been completed in accordance with PBP. The predominant Vegetation is classified by structure or formation using the system adopted by David Keith (2004) and by the general description using PBP.

Vegetation types give rise to radiant heat and fire behaviour characteristics. The predominant vegetation has been determined for the site over a distance of at least 140 metres in all directions from the proposed site boundary or key assets on the development site. Where a mix of vegetation types exist, the type providing the greater hazard is said to predominate.

Given the recent development in the area and past rural management, the vegetation (shown in Figure 5) is limited to a narrow band of low-risk riparian vegetation, two small, isolated pockets of passive open space and areas of grassland. The site and surrounding areas presents a low bushfire risk.

6.4. Slopes Influencing Bushfire Behavior

PBP requires assessment of slope. The slope of the land under the classified vegetation has a direct influence on the rate of fire spread, the intensity of the fire and the ultimate level of radiant heat flux. The effective slope is the slope of the ground under the hazard (vegetation). In identifying the effective slope, it may be found that there are a variety of slopes covering different distances within the vegetation. The effective slope is the slope under the vegetation which will most significantly influence the bushfire behaviour for each transect. This is usually the steepest slope.

Assessment of the slope has been shown at Figure 5 for the site. The site itself slopes gently towards the creekline in the centre of the site, running east. The effective slope throughout the area is less than 5 degrees.

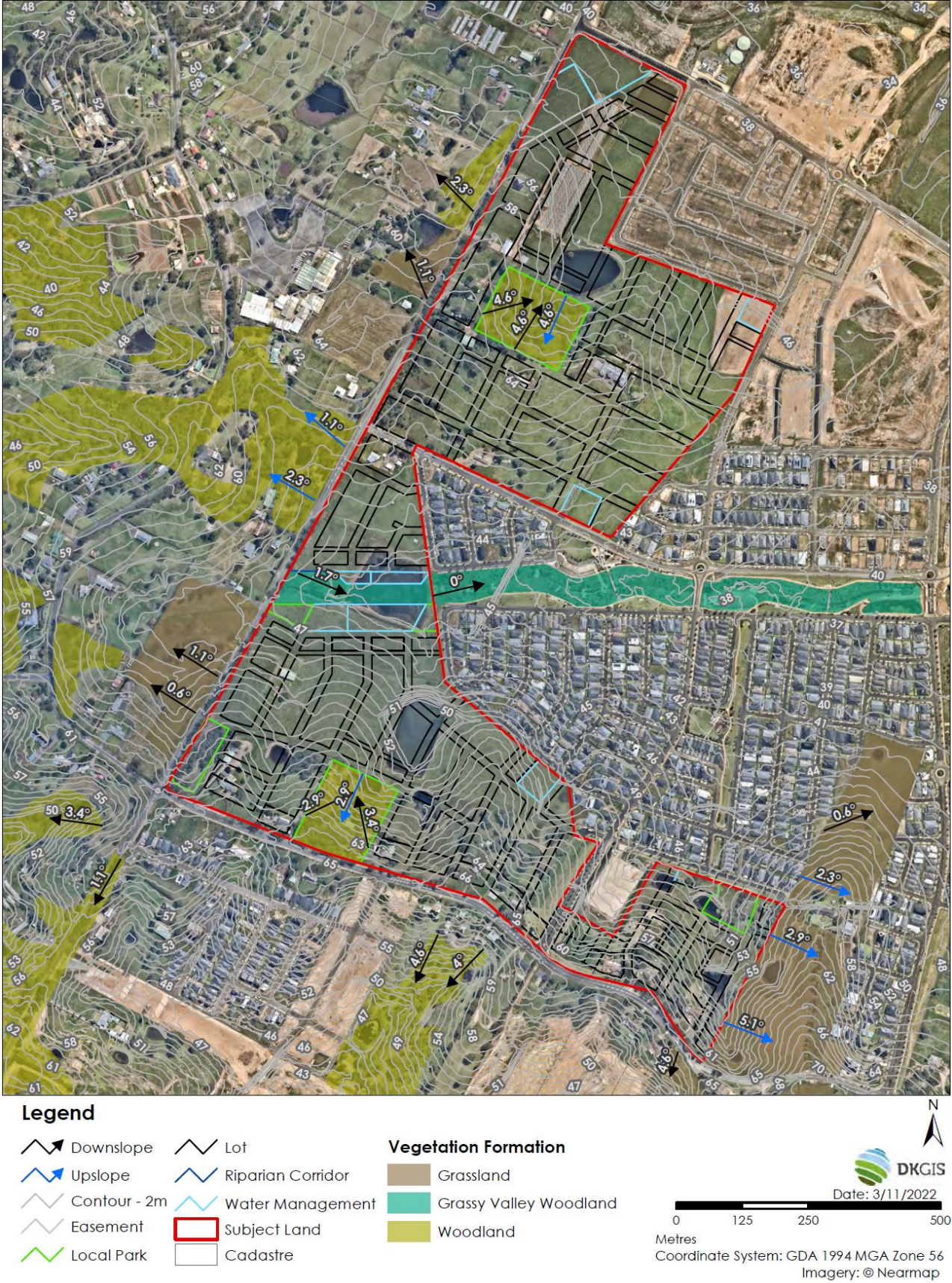


Figure 5: Vegetation and Slope

6.5. Potential Fire Behaviour

Given the recent development in the area and past and present rural management practices, there is limited bushfire behaviour potential within or surrounding the site.

6.6. Fire History

The more substantial bushland areas approximately 1km to the north and northeast have been impacted by bushfires in the past (see Figure 6). This previous fire history presents no concern to the site or any proposed development.

6.7. Potential Fire Runs

As discussed above, there is limited potential fire behaviour potential for the site or surrounding areas and the site cannot be impacted by large landscape scale fires. The Planning Proposal includes PBP compliant APZs and other measures that will allow fires to be managed onsite using the suite of Bushfire Protection Measures.

There is excellent public road access to the site and all future development. The Planning Proposal meets the acceptable solutions for APZs per Table A1.12.2. Lastly, there are no large, connected corridors of vegetation able to carry fire into the site.

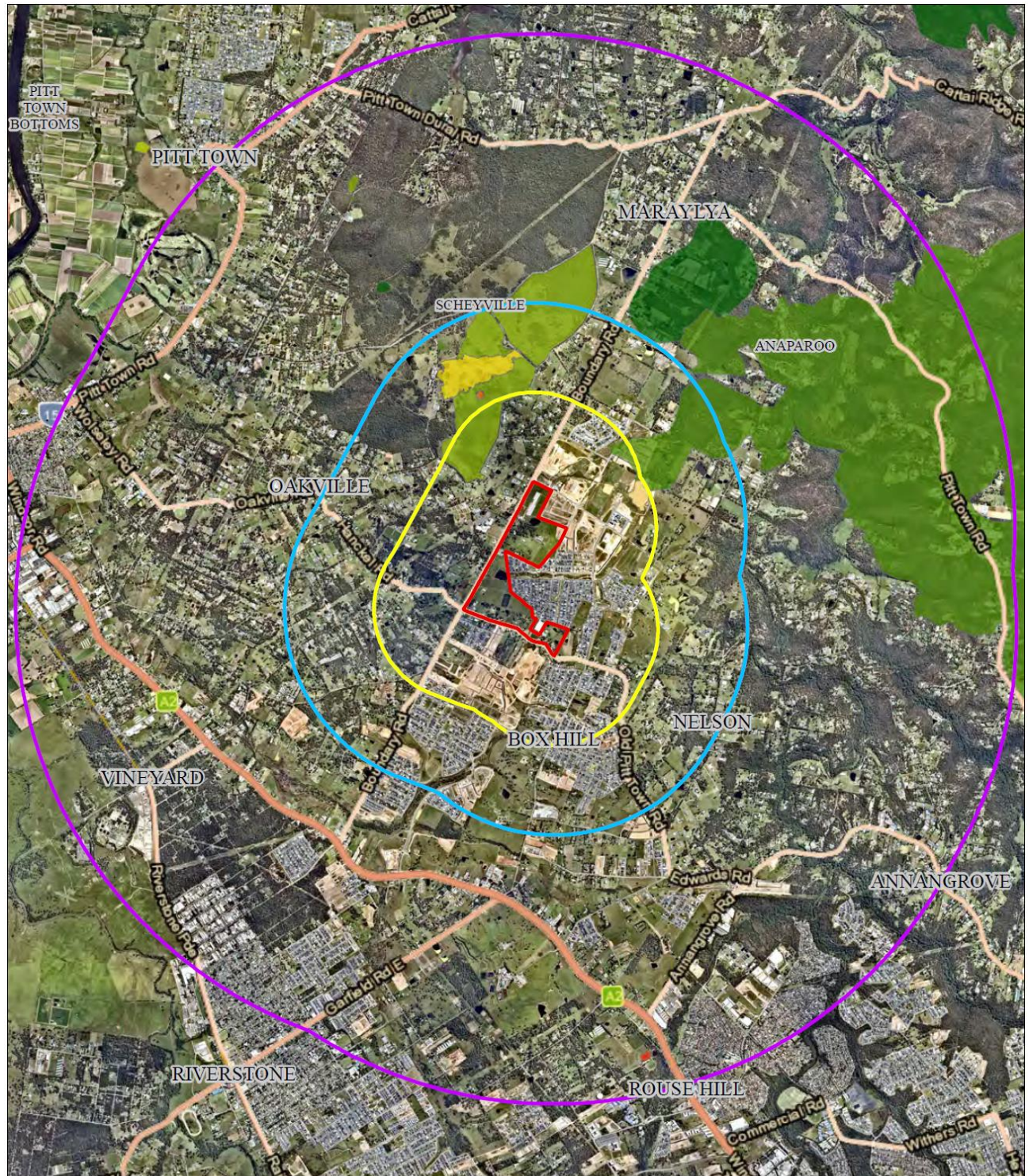
6.8. Fire Suppression

There are no identified difficulties in accessing and suppressing the fires that could occur around or within the site. The site has excellent sealed two-lane public road access, reticulated water, and the depth of the lots will allow firefighting to be conducted predominantly from the street.

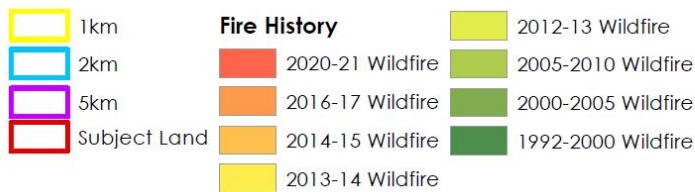
The overall area surrounding the site and the site itself, is characterised by residential development or rural managed properties. The surrounding area is well broken up by existing development, grazed areas, roads, drainage lines, powerline easements and other small breaks providing a range of suppression options based on specific conditions during an incident.

Access for incoming firefighting resources is excellent, with multiple roads and directions, and well-maintained sealed roads which do not need to traverse bushfire prone areas.

There are RFS brigades at Oakville, Rouse Hill, Marsden Park and Kellyville, as well as Fire & Rescue at Riverstone (4km) and Windsor (10km). There are numerous other RFS and Fire & Rescue stations within a 20 minute drive. There are sufficient resources to manage localised fires.



Legend



DKGIS

Date: 30/06/2022

0 0.5 1 2

Kilometers

Coordinate System: GDA 1994 MGA Zone 56

Imagery: © Nearmap

Figure 6: Fire History

7. Land use assessment

7.1. Risk profiles

The intensity of a bushfire, which determines to a large extent how much damage it will do, is a product of the fuels burning (quantity, arrangement, size, moisture content), the weather at the time (temperature, wind speed and direction, relative humidity, atmospheric stability) and the topography of the land where the fire is burning (slope and aspect).

The risk profile of the site and future development area is very low due to the limited bushfire hazard in the area. The PBP compliant APZs will be more than adequate to mitigate the risk.

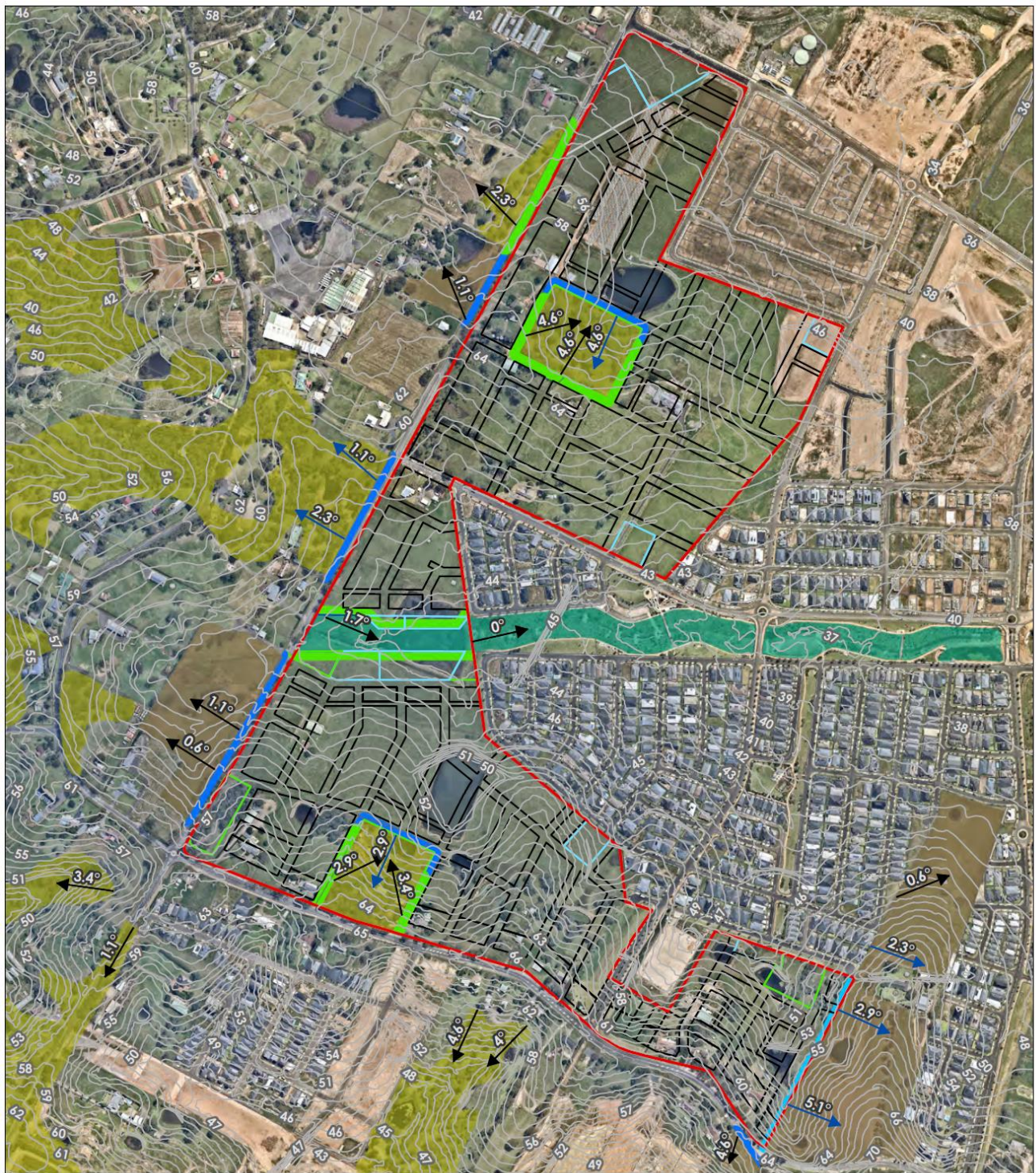
Appropriately designed (in accordance with PBP), constructed (in accordance with AS3959) and prepared buildings may offer people options for sheltering during most bushfires, reducing the likelihood of bushfire-related injury and death. The nationally agreed position is that the safest option is to leave a bushfire prone area early on days with a Fire Danger Rating of Severe or higher.

The bushfire risk is best mitigated by compliance with PBP and the ability of the Planning Proposal to provide complying APZs.

Asset Protection Zones

For proposed new subdivision development, PBP requires that a minimum separation is provided in the form of APZ. The APZ is a fuel-reduced, physical separation between buildings and bushfire hazards. For residential developments, APZ requirements are based on keeping radiant heat levels at buildings below 29kW/m² as the maximum exposure on all sides of the building.

The proposed development location consists of limited vegetation onsite, however a conservative approach has been taken and the site has sufficient room to provide compliant APZ and practical building envelopes for the entire site. This includes the sites adjoining the very narrow riparian corridor and isolated passive open space areas. Figure 7 shows the APZ requirements.



Legend

- | | | |
|--------------|-----------------------------|------------------------------|
| Downslope | Riparian Corridor | Grassy Valley Woodland |
| Upslope | Water Management | Woodland |
| Contour - 2m | Subject Land | Asset Protection Zone |
| Easement | Cadastre | Asset Protection Zone - 10m |
| Local Park | Vegetation Formation | Asset Protection Zone - 12m |
| Lot | Grassland | Asset Protection Zone - 16m |

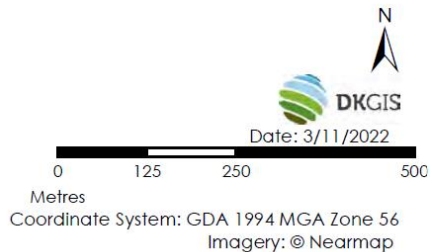


Figure 7: Asset Protection Zones

8. Access and egress

8.1. Capacity

The site has existing connections to the arterial and local road networks that service the region. This enables the effective distribution of traffic from the site to the wider road network. The future lots will have direct access to public roads. The local road network is capable of servicing the volumes of traffic generated by the future subdivision and while not considered ever required, the roads could accommodate the evacuation of residents and concurrently the responding of emergency services.

The low bushfire risk means residents will shelter in place with compliant APZs and all future housing constructed to the appropriate requirements of AS3959.

The road network meets the standards detailed in the provisions of Table 5.3b and the planning proposal complies with PBP.

8.2. The location of key access routes and direction of travel

The national position of fire agencies is that *the safest action to protect life is for people to be away from the bushfire or threat of bushfire*⁴. This is underpinned by comprehensive emergency management arrangements and operational fire management systems that focus on the provision of information, advice, and warnings to assist communities to make informed decisions prior to the impact of bushfire and if necessary be out of Bushfire Prone Areas well before the impact of fire.

Given the nature of the site and the limited bushfire risk, there are no key access roads which will be impacted by bushfire in a manner that will cause issues for residents or responding brigades. The site provides for travel in all directions with limited bushfire risk.

8.3. The potential for development to be isolated in the event of a bush fire.

There is no risk that the site can be isolated in the event of a bushfire.

⁴ Australasian Fire and Emergency Services Authorities Council. (2019) *Bushfires and Community Safety Position* (AFAC Publication No. 2028)

9. Emergency Services

9.1. Demand for emergency services

The nature of the bushfire risk does not create a potential increase in demand for emergency services responding to a bush fire emergency considered above or beyond the typical demands for such a development.

9.2. Ability of emergency services to carry out fire suppression.

The nature of the bushfire risk and proposed development does not impact on the ability of emergency services to carry out fire suppression in a bushfire emergency.

10. Infrastructure

10.1. Reticulated water

The subsequent development applications will detail provisions for water. The Site will be serviced by reticulated water which, given the low bushfire risk, is appropriate to deal with a bushfire in the local area. Details can be resolved during development applications stage. This complies with PBP.

Electricity supply for the new development will comply with PBP. Any gas services are to be installed and maintained in accordance with *Australian Standard AS/NZS 1596 'The storage and handling of LP Gas'* (Standards Australia 2008). This complies with PBP.

10.2. Life safety issues

There are no high voltage power lines or gas lines on the site.

11. Adjoining Land

11.1. Implications on Adjoining Land

The change in land use will have no negative implications on adjoining land from a bushfire perspective. The site will be full self-sufficient in terms of BPMs and no increased bushfire risk will be created.

12. Bush Fire Strategic Study - Summary

As per the analysis in sections 9-11 above, the site is in a low bushfire risk area and can provide all BPMs as required by PBP 2019 and is therefore considered appropriate in the bush fire hazard context.

13. Suitability of the Planning Proposal

This SBS had demonstrated that the Planning Proposal has considered and responded to the requirements of PBP. In a bushfire context, PBP (p. 34) requires that *strategic planning must ensure that future land uses are in appropriate locations to minimise the risk to life and property from bush fire attack. Services and infrastructure that facilitate effective suppression of bushfires also need to be provided for at the earliest stages of planning.*

The bushfire risk has been considered at the macro-scale, looking at fire runs, slopes, fire behaviour, bushfire attack into the site and it has addressed the access and evacuation requirements of PBP.

This section assesses the broad principles outlined within PBP (p. 34) which are at Table 3 and the consideration of exclusion of development as required within PBP (p. 34) at Table 4.

Table 1: Strategic Principles

Principle within PBP	Comment	Compliance
ensuring land is suitable for development in the context of bushfire risk	The site is in a low bushfire risk area and the Planning Proposal provides compliance with the deemed to satisfy requirements of PBP in all BPM. The bushfire risk to future occupants and emergency services can be appropriately managed by meeting the requirements of PBP.	Yes
ensuring new development on BPL will comply with PBP	The Planning Proposal meets all deemed to satisfy requirements of PBP. Future development will meet the standard of <29kW/m ² radiant heat at building exposures. Roads and APZs comply with PBP.	Yes

Principle within PBP	Comment	Compliance
minimising reliance on performance-based solutions	No performance-based solutions have been proposed or used in this assessment. All BPM have been met using acceptable solutions provisions within PBP.	Yes
providing adequate infrastructure associated with emergency evacuation and firefighting operations	The existing and proposed road network meets the minimum requirements of PBP. All services can be provided in accordance with Table 5.3c of PBP.	Yes
facilitating appropriate ongoing land management practices	The future development will not burden or change the existing obligations or management actions of neighbours. The site will be full self-sufficient in terms of BPMs and no increased bushfire risk will be created.	Yes

Table 2: Exclusion of Development

Principle within PBP	Comment	Compliance
the development area is exposed to a high bush fire risk and should be avoided	The site is in a low bushfire risk area. The new development lots will comply with the minimum requirements of PBP, and the risk has been managed to the appropriate level required by PBP.	Yes
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	The site has existing connections to the arterial and local road networks that service the region. The local road network is capable of servicing the volumes of traffic generated by the future subdivision and while not considered ever required, the roads could accommodate the evacuation of residents and concurrently the responding of emergency services.	Yes

Principle within PBP	Comment	Compliance
the development will adversely effect other bush fire protection strategies or place existing development at increased risk	The change in land use will have no negative implications on adjoining land from a bushfire perspective. The site will be full self-sufficient in terms of BPMs and no increased bushfire risk will be created.	Yes
the development is within an area of high bushfire risk where density of existing development may cause evacuation issues for both existing and new occupants	Given the nature of the site and the limited bushfire risk, there are no key access roads which will be impacted by bushfire in a manner that will cause issues for residents or responding brigades. The site provides for travel in all directions with limited bushfire risk.	Yes
the development has environmental constraints to the area which cannot be overcome	The environmental constraints have been considered and assessed separately. The Planning Proposal layout reflects the environmental constraints.	Yes

14. Conclusion

This Strategic Bushfire Study considers the suitability of the Planning Proposal with respect to bushfire risk. The Planning Proposal provides a well-considered design that as appropriate in the context of the low bushfire risk affecting the site and the aim and subsequent requirements within PBP to provide for the protection of life and the minimisation of impact on property while having due regard to the development potential, site characteristics and protection of the environment.

This SBS has followed the Aim and Objectives of *PBP*, Section 2.3 Strategic Planning, and specifically addressed the requirements of Chapter 4 – Strategic Planning. The suitability of the Planning Proposal has considered the broad land scape scale risk and the site-specific requirements of PBP.

The proposed residential subdivision zoning has been assessed against PBP Chapter 5 – Residential and Rural Residential Subdivisions to satisfy the requirements of Section 4.4.1 regarding indicative development layout. The proposed development can satisfy the detailed criteria to be assessed at the next stage of the process. All future lots will be supported by APZ to meet the standard of <29kW/m² at building exposures and will be further assessed at development application stage. The Planning Proposal meets the requirements of PBP and should be supported.

In the authors professional opinion, the Planning Proposal is a suitable use of the land, and the bushfire protection measures demonstrated in this report comply with the Aim and Objectives of Planning for Bush Fire Protection 2019, the Ministerial Direction 4.4 Planning for Bush Fire Protection, and allow for the issue of a Gateway Determination with respect to bushfire matters.



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Fire Protection Association of Australia BPAD Level 3 - 34603



Appendix 1: References

Australasian Fire and Emergency Service Authorities Council (2012) *Bushfires and Community Safety*

Australasian Fire and Emergency Service Authorities Council (2019) *Bushfires and Community Safety*

Australian Institute for Disaster Resilience (2020) *Land Use Planning for Disaster Resilient Communities*

Bush Fire Management Committee (2017) *Wollondilly-Wingecarribee Bush Fire Risk Management Plan*. Approved by NSW Bush Fire Coordinating Committee.

Keith, David (2004) – *Ocean Shores to Desert Dunes – The Native Vegetation of New South Wales and the ACT*. The Department of Environment and Climate Change

NSW Rural Fire Service (2015) *Guide for Bush Fire Prone Land Mapping*

NSW Rural Fire Service (2019). *Planning for Bush Fire Protection: A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners*.

NSW Rural Fire Service (2017) *Neighbourhood Safer Places: Guidelines for the Identification and Inspection of Neighbourhood Safer Places in NSW*. Issued November 2019.

NSW Government (1979) *Environmental Planning and Assessment Act 1979*. NSW Government Printer.

Standards Australia (2017) *Fire hydrant installations - System design, installation and commissioning*, AS 2419.1, SAI Global, Sydney.

Standards Australia (2018) *Construction of buildings in bushfire-prone areas*, AS 3959-2018. SAI Global, Sydney.

Standards Australia (2014) *The storage and handling of LP Gas*, AS/NZS 1596:2014. SAI Global, Sydney.

Appendix 2: EP&A Act 1979 – Section 9.1 Ministerial Direction

LOCAL PLANNING DIRECTIONS

Section 9.1(2) of the *Environmental Planning and Assessment Act 1979*

4.4 Planning for Bushfire Protection

Objectives

- (1) The objectives of this direction are:
 - (a) to protect life, property and the environment from bush fire hazards, by discouraging the establishment of incompatible land uses in bush fire prone areas, and
 - (b) to encourage sound management of bush fire prone areas.

Where this direction applies

- (2) This direction applies to all local government areas in which the responsible Council is required to prepare a bush fire prone land map under section 10.3 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act), or, until such a map has been certified by the Commissioner of the NSW Rural Fire Service, a map referred to in Schedule 6 of that Act.

When this direction applies

- (3) This direction applies when a relevant planning authority prepares a planning proposal that will affect, or is in proximity to land mapped as bushfire prone land.

What a relevant planning authority must do if this direction applies

- (4) In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 3.34 of the Act, and prior to undertaking community consultation in satisfaction of Schedule 1, clause 4 of the Act, and take into account any comments so made,
- (5) A planning proposal must:
 - (a) have regard to *Planning for Bushfire Protection 2019*,
 - (b) introduce controls that avoid placing inappropriate developments in hazardous areas, and
 - (c) ensure that bushfire hazard reduction is not prohibited within the APZ.
- (6) A planning proposal must, where development is proposed, comply with the following provisions, as appropriate:
 - (a) provide an Asset Protection Zone (APZ) incorporating at a minimum:
 - (i) an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and
 - (ii) an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road,
 - (b) for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the *Rural Fires Act 1997*), the APZ provisions must be complied with,
 - (c) contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks,
 - (d) contain provisions for adequate water supply for firefighting purposes,
 - (e) minimise the perimeter of the area of land interfacing the hazard which may be developed,
 - (f) introduce controls on the placement of combustible materials in the Inner Protection Area.

Consistency

- (7) A planning proposal may be inconsistent with the terms of this direction only if the relevant planning authority can satisfy the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General) that the council has obtained written advice from the Commissioner of the NSW Rural Fire Service, to the effect that, notwithstanding the non-compliance, the NSW Rural Fire Service does not object to the progression of the planning proposal.

Direction 4.4 – issued 20 February 2020