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# AMENDED BUSH FIRE ASSESSMENT REPORT

## Lot 100 DP 1201719

## Hills Road, Rileys Hill

Proposed Rezoning of Land from RU1 to RU5 (s100B)

Prepared for: Alan Cardy

Prepared by:
Peter Thornton
BPAD-L3 ACCREDITED PRACTITIONER

**Date:** 3 November 2020

**Ref:** 18/176

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**DOCUMENT CONTROL**

| Revision | Date | Description | Prepared | Checked | Authorised |
|---|---|---|---|---|---|
| A | 08.06.2018 | Rezoning | Scott Sewell | PJT | Peter Thornton |
| B | 14.04.2020 | Amended Report | Peter Thornton | SJT | Peter Thornton |
| C | 22.04.2020 | Final Report | Peter Thornton | SJT | Peter Thornton |
| D | 03.11.2020 | Amended Report | Peter Thornton | SJT | Peter Thornton |

## Table of Contents

## 1.0 EXECUTIVE SUMMARY

This amended bushfire assessment report supersedes the original report dated 8 June 2018 and subsequent addendum dated 22nd April 2020 prepared by this office which was submitted with the Rileys Hill Planning Proposal – PP2016-0006. This report assesses the latest amended proposal and indicative subdivision design against the provisions of Planning for Bushfire Protection 2019 although it is noted lodgment of the development application was prior to 1 March 2020 when Planning for Bushfire Protection 2006 was legislated.

The report relates to proposal being –

*"Planning Proposal (Department Ref: PP_2018_RICHM_001_00): to rezone part of Lot 100 DP 1201719 at Hills Road, Rileys Hill from RU1 Primary Production to RU5 Village and change the minimum lot size from 40 hectares to 600m$^2$ to enable the land to be developed for low density residential purposes."*

The report establishes compliance with the performance criteria of Planning for Bushfire Protection 2019 can be achieved with the rezoning of the subject property. It is noted that a performance solution for this indicative layout would be required with the future development application for subdivision as no perimeter road is present and exceptional circumstances for part of the required asset protection zone to be located on the residual RU1 allotment. This report however does provide adequate information to demonstrate that a reasonable performance solution is available for the indicative subdivision design presented subject to the recommendations in this report.

The primary items that will need consideration at this rezoning stage are as follows –

- Indicative Lot 6 will not be capable of supporting the required 20m APZ within the allotment and will need to be redesigned with the future application for subdivision.
- The emergency access/egress road adjacent to proposed Lot 35 will require formalising with an easement and 88b instrument or should NSW RFS require this connection to form part of the public road system then a condition can be applied. Either way, the connecting road will be required to comply with the general and public road access requirements of Table 5b of Planning for Bushfire Protection 2019.

## 2.0 PROPOSED DEVELOPMENT

This report has been prepared to establish that the land at Lot 100 DP 1201719, Hills Road Rileys Hill proposed for rezoning from RU1 – Primary Production to part RU5 – Village and part E2 – Environmental Conservation is capable of complying with Planning for Bushfire Protection 2019 in consultation with the NSW Rural Fire Service for a future residential subdivision.


Figure 1: Location of subject property *NSW Govt. Six Maps*

## 2.1 PROPOSED RE-ZONING

The following description of the modified rezoning application is provided by Ardill Payne and Partners –

*"Planning Proposal (Department Ref: PP_2018_RICHM_001_00): to rezone part of Lot 100 DP 1201719 at Hills Road, Rileys Hill from RU1 Primary Production to RU5 Village and change the minimum lot size from 40 hectares to 600m$^2$ to enable the land to be developed for low density residential purposes."*

The proposed modified concept subdivision layout is provided as follows in Figure 2.

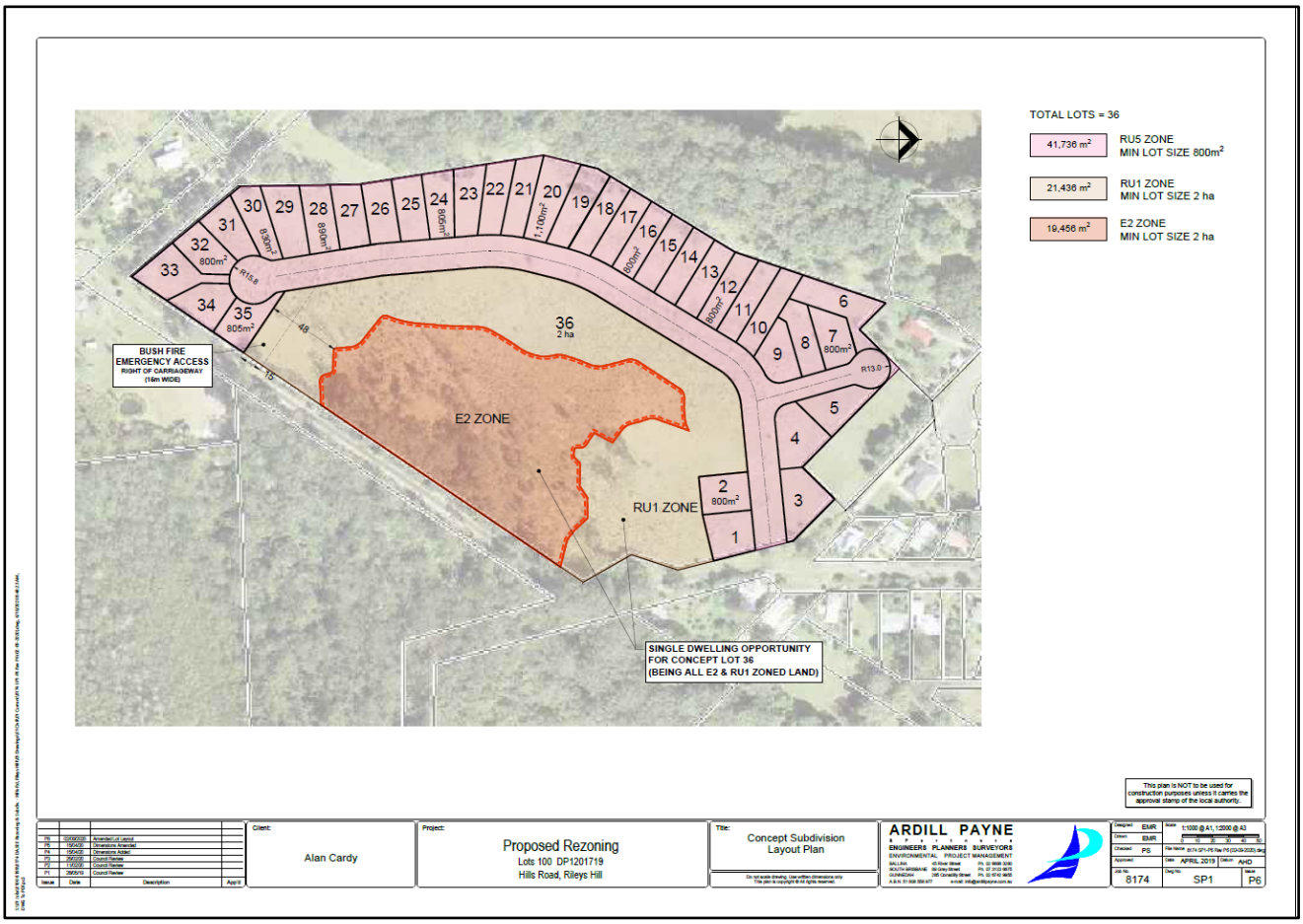



Figure 2: Concept subdivision layout (larger image in Appendix A)

## 3.0 BUSH FIRE ASSESSMENT AND ASSET PROTECTION ZONES

The bushfire prone mapping identifies the subject allotment as being bushfire prone (see Figure 3). Aerial mapping and inspection of the site reveals that the bushfire prone land map is reasonably accurate in respect to the current bushfire hazard although there was remnant forest in the lower southeastern precinct of the property which is going to be conserved as part of the application. In this regard, this area will likely be mapped as a hazard with future mapping and is considered as such with this assessment.

Inspection of the subject property was undertaken and bushfire assessment conducted within and 140m beyond the boundary of the subject development area. The assessment established a number of vegetation communities that are detailed in Planning for Bushfire Protection 2019.

Grassland to the south.

Grassland to the east.

Grassland located looking south toward the proposed E2 Zone (forest)

Further beyond the proposed E2 Zone is Hills Road which is located adjacent to the east boundary of the subject property and extends also along the southern boundary. To the east of Hills Road is Broadwater National Park having an area of approximately 4,290 hectares of a combination of heath, forest, forested wetland and woodland.

- To the west / southwest of potential Lots 21 -34 is remnant vegetation located on an upslope where it extends to the top of a ridge. Beyond the ridge is a downslope consisting of grassland with exception to the southwest of Lot 27-29 where there is forest on a downslope over a short distance. By utilising a split assessment through the upslope adjacent to the rear boundaries of the indicative allotments will be the slope that is most likely to influence the bushfire behaviour at this location.

Forest on an upslope. Photo taken from the south.

Further to the west, beyond the grazing land, is Rileys Hill Road adjacent to the Richmond River. Unlike the bushfire hazard to the east where the potential fire run is extensive, the western aspect has generally fragmented vegetation with short fire runs and the Richmond River providing a fire break.

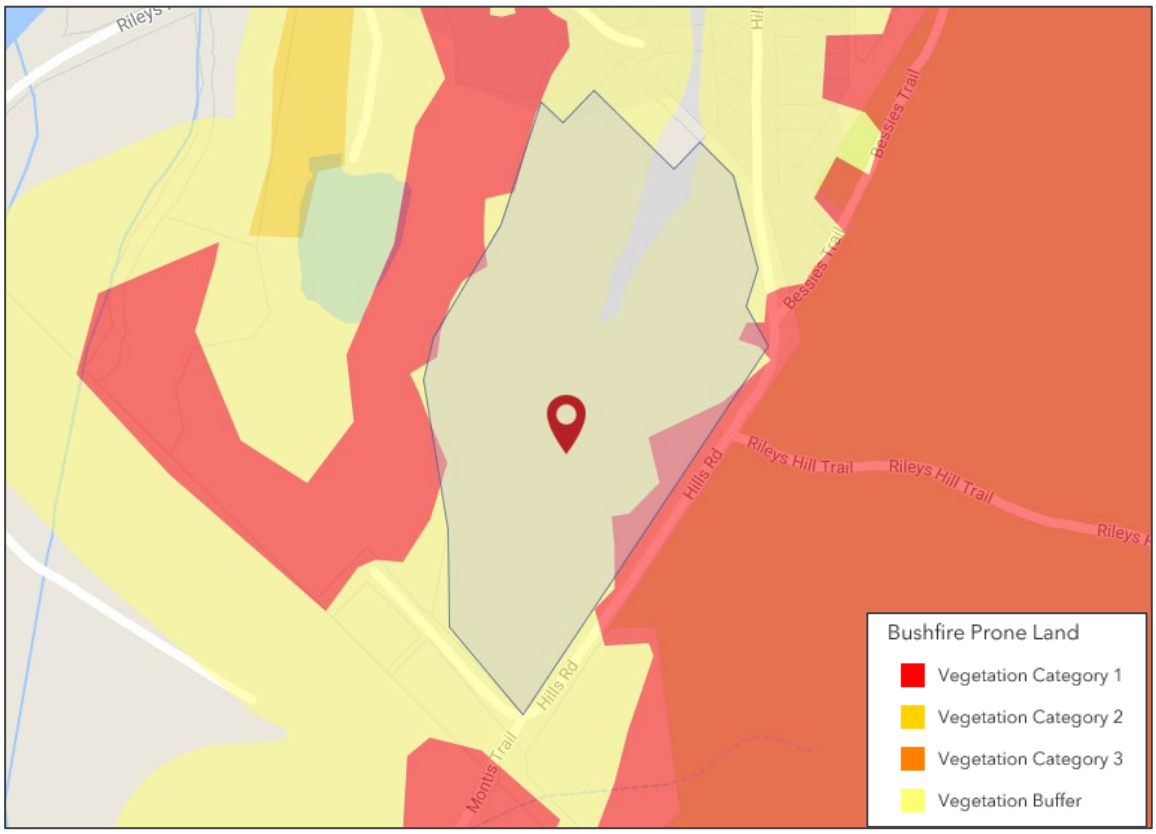



Figure 3: Bushfire prone land map *planningportal.nsw.gov.au*

Asset Protection Zones are areas established and maintained to ensure that bushfire fuels are progressively reduced between the development and the bushfire hazard. The asset protection zone incorporates an Inner Protection Area (IPA) having reduced fuel loadings of approximately 3t/ha. The assessment establishes that future residential development will require asset protection zones.

The proposed future residential subdivision will be required to comply with the APZ criteria for infill developments as set out in Section 5.3.1 and Table 5.3a of PBP2019 which states:

- APZs are provided in accordance with Table A1.12.2 or A1.12.3 based on the FFDI.
- APZs are to be managed in accordance with the requirements of Appendix 4 (of PBP).
- APZs are wholly within the boundaries of the development site.
- APZ are located on lands with a slope less than 18 degrees.

It is noted in relation to dot point 3 the asset protection zones will be within the boundaries of the development site but will require an easement and 88b instrument given they will be partially located within the residual allotment which will have a dwelling entitlement. A future dwelling on the proposed lots is capable of being sited to receive <=29kW/m$^2$ and is to be assessed in accordance with s4.14 at Development Application stage.

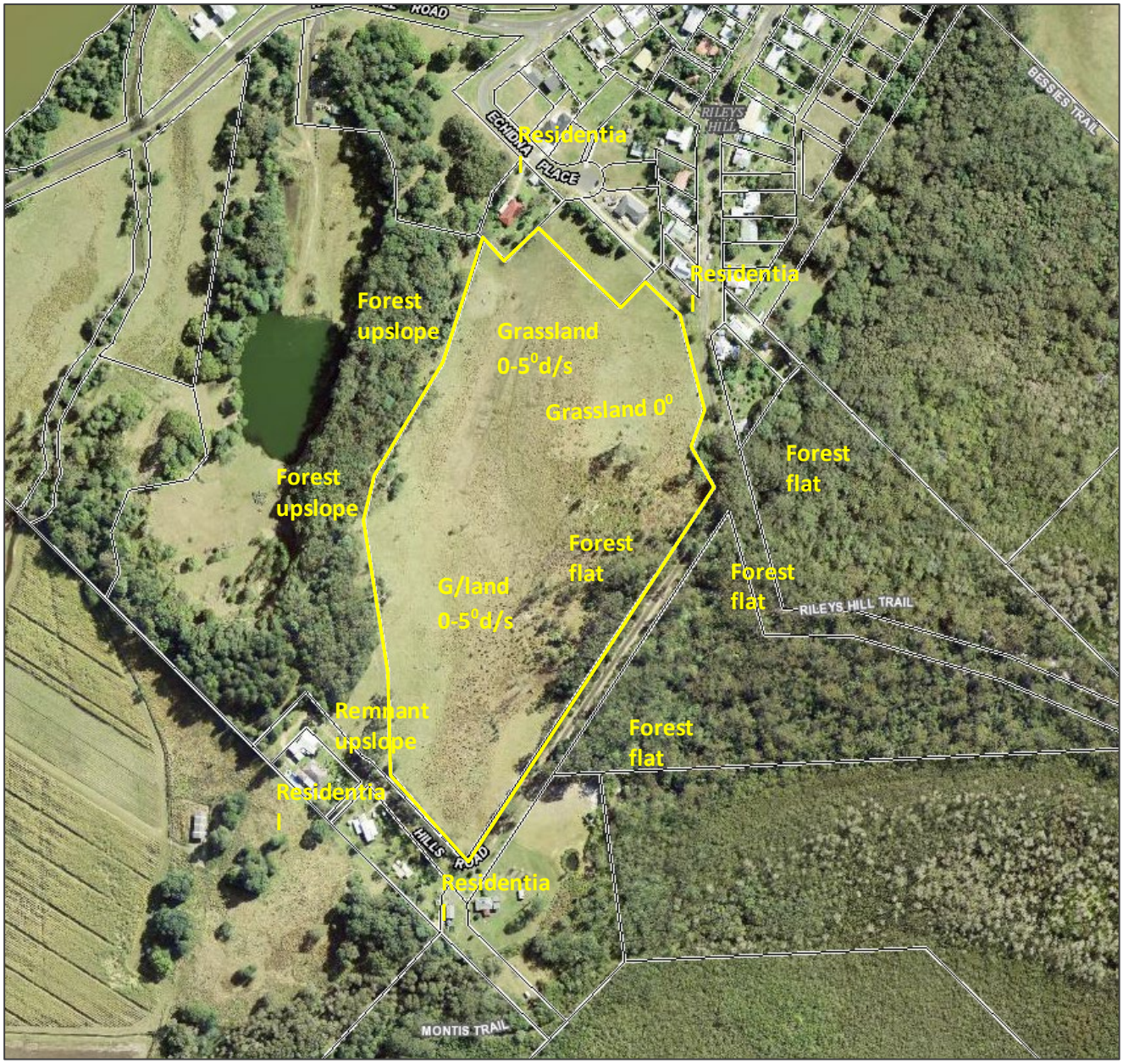



Figure 4: Bushfire threat analysis *Map Source: NSW Govt. Six Maps*

**Table 1: Summary of Preliminary Asset Protection Zones required**

| LOT | Aspect | Vegetation | Distance to Vegetation | Slope | REQUIRED APZ Table A1.12.3 |
|---|---|---|---|---|---|
| 1 | East | Forest | Approx. 80m | 0-5$^{0}$ d/s | To boundary. Managed land of road reserve and adjacent properties provides sufficient buffer. |
| | South | Grassland | Abuts boundary then forest vegetation 70m away on flat land. Grassland is dominant. | 0$^{0}$ | 10m |
| 2 | South | Grassland | Abuts boundary then forest vegetation 70m away on flat land. Grassland is dominant. | 0$^{0}$ | 10m |
| | West | Grassland | Abuts boundary | 0$^{0}$ upslope | 10m (maybe reduced with upslope modelling and fence if needed). |
| 3 | Southwest | Grassland | Abuts boundary | 0$^{0}$ s/s | 10m (provided in road reserve) |
| 4 | South | Grassland | Abuts boundary then forest vegetation 80m away on flat land. Grassland is dominant | 0-5$^{0}$ d/s | 12m (provided in road reserve) |
| 5 | Northwest and west | Forest | 60m | 0$^{0}$ u/s | 20m (provided in adjoining properties and road reserve) |
| 6-30 | West and southwest | Forest | Abuts north boundary | 0$^{0}$ u/s | 20m – <u>It is noted Lot 6 will need to be removed or adjusted to comply. Current layout cannot support a 20m APZ within the allotment.</u> |
| | East | Grassland | Grassland is located on the east side of the public road then forest located approximately 30-50m from the road reserve. Both vegetation classifications are on a similar slope. | 0-5$^{0}$ d/s | 25m (primarily supported within the road reserve and future front building line) |
| 30-33 | S, SE, SW | Remnant | Abuts boundary | 0$^{0}$ | 9m (within property and road reserve) |

| | | | | | |
|---|---|---|---|---|---|
| 34 | East, SE | Remnant | Abuts boundary | $0^0$ | 9m (within property and road reserve) |
| 35 | Northeast | Forest | Abuts boundary | $0^0$ | 20m (within property and emergency road reserve) |

The APZs will be supported within each proposed allotment or being within adjoining proposed residential allotment which, with a future subdivision will all require management to an Inner Protection Area standard pursuant to Planning for Bushfire Protection 2019. In some cases, such as Lot 35 and the majority of the western allotments, the asset protection zones will be supported within the future formed road reserves/emergency egress easement shown to have a width of 15m.

The plans are to indicate an indicative compliant building envelope can be supported on the future allotments in conjunction with the recommended asset protection zones.

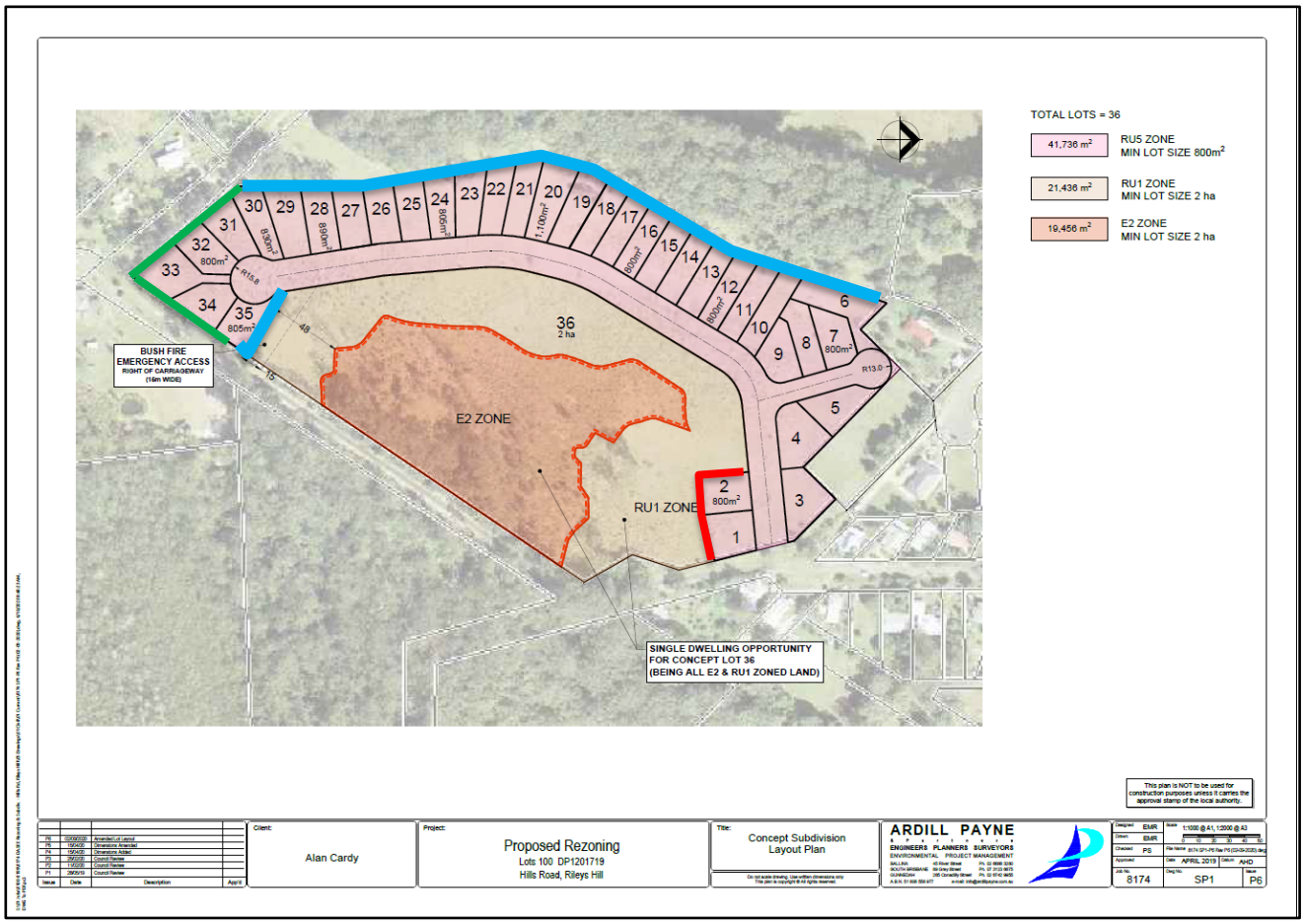



Figure 5: Locations of required APZs to be wholly within the future allotments with exception to areas managed within the proposed and existing road reserves.
Green = 9m, Red = 10m and Blue = 20m.

## 4.0 CONSTRUCTION STANDARDS AND OTHER PLANNING CONTROLS

The land available for the required asset protection zones will allow construction of future dwellings to be undertaken in accordance with a maximum of BAL 29 AS 3959-2018. The APZs shown will ensure that the future dwellings will not be within the forecast flame zone.

The future use of the rezoned land for residential purposes will require approval of an 'integrated' development application for subdivision under s.91 of the EP&A Act (requiring the issue of a s.100B Rural Fires Act bushfire safety authority) and development application/s for any dwellings under s.4.14 of the EP&A Act (requiring referral to the NSW Rural Fire Service).

The indicative site plan may need to be amended at subdivision stage.

## 5.0 WATER AND UTILITY SERVICES

### 5.1 WATER SUPPLY

The development is to be connected to a reticulated water supply. A future water supply is to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019.

### 5.2 ELECTRICITY SUPPLY

New electrical transmission lines if required are to comply with Section 5.3.3 and Table 5.3c of Planning for Bushfire Protection 2019 as follows:

- where practicable, electrical transmission lines are underground; and
- where overhead, electrical transmission lines are proposed as follows:
  - lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and
  - 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*.

### 5.3 GAS SERVICES

The development applications for future dwellings will provide details of the storage of gas to comply with Section 7.4 and Table 7.4a of Planning for Bushfire Protection 2019.

## 6.0 ACCESS

Access will be required to comply with Table 5.3b – Non-Perimeter Roads in Planning for Bushfire Protection 2019.

The following performance solution has been provided in order to gain concurrence of the initial access layout and specification to allow the continuation of planning for the subdivision development application.

### 6.1 NO PERIMETER ROAD

Although 'perimeter roads' are 'the preferred option' the report considers, given the relatively low bushfire risk to a future subdivision being predominantly short fire run of forest to the west, a perimeter road will not be required and the 8m wide specification is not required.

S4.1.3(1) – Public Roads in Planning for Bushfire Protection 2006 states that a 'perimeter road' is the 'preferred' option to separate bushland from urban areas, however it is acknowledged that other options are permissible. The purpose of the public road system is to:

- Provide fire-fighters with easier access to structures, allowing more efficient use of fire-fighting resources;
- Provide a safe retreat for fire-fighters; and
- Provide a clear control line from which to conduct hazard reduction or back burning.

The performance criterion relating to this section of Public Roads in Planning for Bushfire Protection 2006 is as follows:

> *'Public road widths and design that allow safe access for fire-fighters while residents are evacuating an area'*

The performance criterion relating to perimeter road in Planning for Bushfire Protection 2019 is as follows:

> *'Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating as well as providing a safe operational environment for emergency service personnel during firefighting and emergency management on the interface'*

Discussions were undertaken with Alan Bawden 31st July 2019 where it was agreed the bushfire risk to the west did not warrant a perimeter road however it was preferred for the proposed road to connect to Hills Road to provide adequate connectivity. Also discussed was the requirements for an available turning area at the end of the proposed road and before the Hills Road connection.

Hills Road is located to the east of the subject site and whilst the road is narrow it does provide opportunity for RFS access if needed. The connectivity to the proposed road will increase the level of

bushfire safety for fire fighters in a bushfire event and to existing residents accessed by Hills Road by providing a second option to evacuate.

Hills Road to the adjacent to the eastern boundary of the subject property.

As shown in Figure 6 the new road will increase the accessibility to the bushfire hazard and other property above that already existing. The large areas of relative flat grassland to the south and east of Lots 1, 2 and the proposed public road will allow access to the small area of forest in the proposed E2 zone and will also assist in reducing the likelihood of the proposed road being cut in a bushfire event. However, consideration has also been given to the existing location of Hills Road which can also be used as an access point to the hazard or egress if needed.

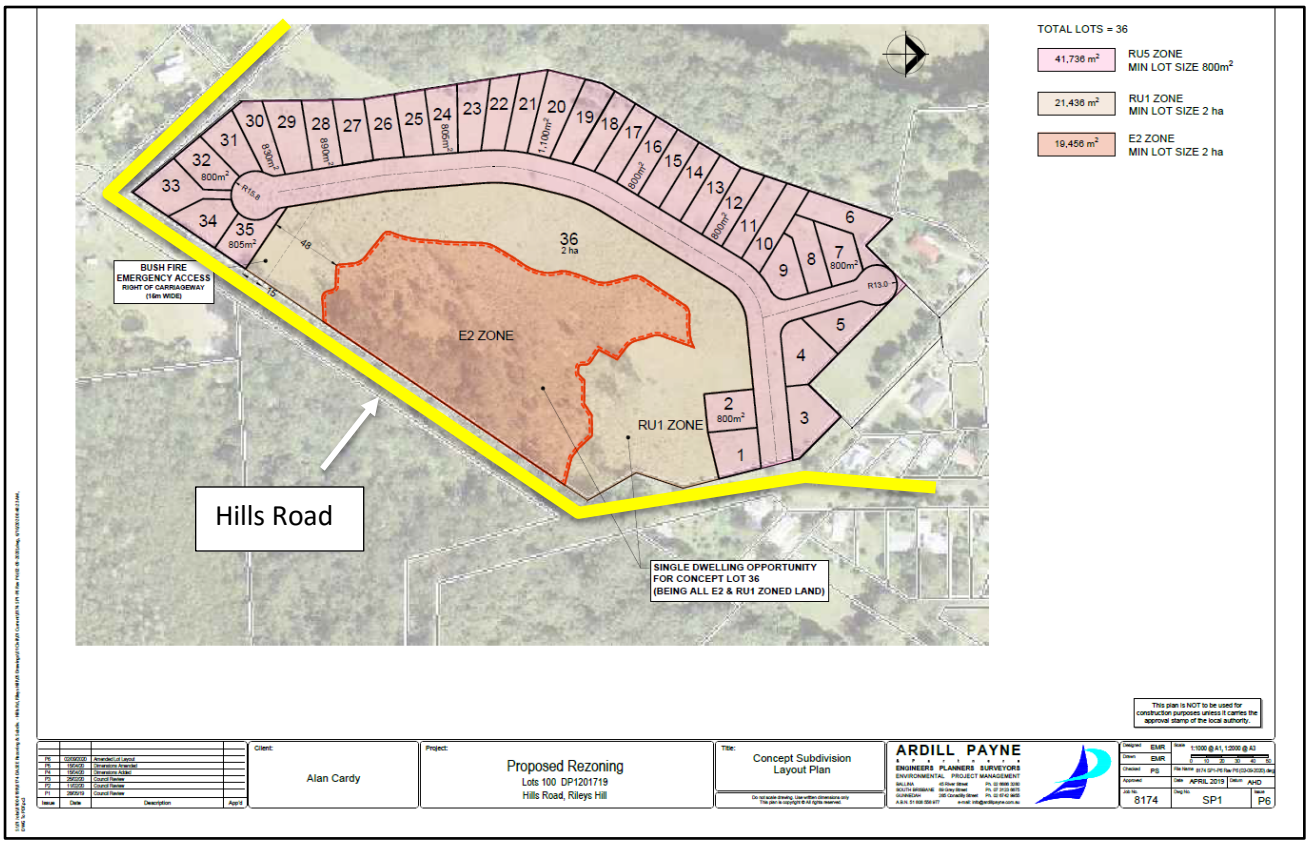



Figure 6: Location of Hills Road and connection to the future public road.

Further consideration was given to the junction of the future road and the eastern end of Hills Road on the outskirts of the village. The junction is greater than 67m from the forest to the east which is located on a reasonably flat topography overall. Pursuant to Table A1.12.1 of PBP2019 this junction is not likely to receive a forecast radiant heat level exceeding 10kW/$m^2$ from the primary hazard and is unlikely to be cut in a bushfire event.

The applicant also indicates and consistent with the NSW RFS advice with the previous request for further information, a connection from the proposed public road through to Hill Road on the south and east perimeter of the subject property. Hills Road will be upgraded and widened as outlined in the traffic report submitted with the development application. The applicant has provided a 15m easement for emergency access/egress to be formed to meet the requirements for public roads pursuant to Section 5.3b Planning for Bushfire Protection 2019. Should this be required as an extension of the public road then the applicant has advised this detail can be provided with the future application for subdivision.

Figure 7: The junction to the eastern end of Hills Road

A Traffic Impact Assessment has been prepared by Ardill Payne and Partners dated October 2020 and addresses the safety and emergency services of the existing and future road. The report also makes the recommendation that *"Hills Road be upgraded to a minimum 7m wide carriageway with mountable kerb both sides, which would relate to the future subdivision of the land (post development)".*

It is therefore considered the indicative subdivision with a significantly amended layout and reduced residential area and lot numbers together with the connection to Hills Road will comply with the performance criteria and increase safety for egress for existing residents and fire fighter above that existing.

## 7.0 CONCLUSION

The report establishes the rezoning will be capable of supporting future residential development from a bushfire perspective. The report demonstrates the level of compliance with the current Planning for Bushfire Protection 2019 with exception to the perimeter road performance criteria which is set to Planning for Bushfire Protection 2006 given the date of lodgment. It is noted the performance criteria is similar to PBP2019 in any case. The report provides recommendation to achieve compliance which should be taken into account with a future application for subdivision.

**Disclaimer**

This report was prepared for the purposes and exclusive use of the stated client to accompany a submission of a re-zoning application of the subject property for future residential Class 1a dwellings only, and is not to be used for any other purpose or by any other person or Corporation. BCA Check Pty Ltd accepts no responsibility for any loss or damage suffered howsoever arising to any person or Corporation who may use or rely on this report in contravention of the terms of this clause.

Reporting has been based on the relevant Council and Rural Fire Service Guidelines; however, recommendations given in this report are based on our site investigation at the time of reporting. In some cases site conditions may change dramatically within a few years due to rapid vegetation re-growth and invading weed species.

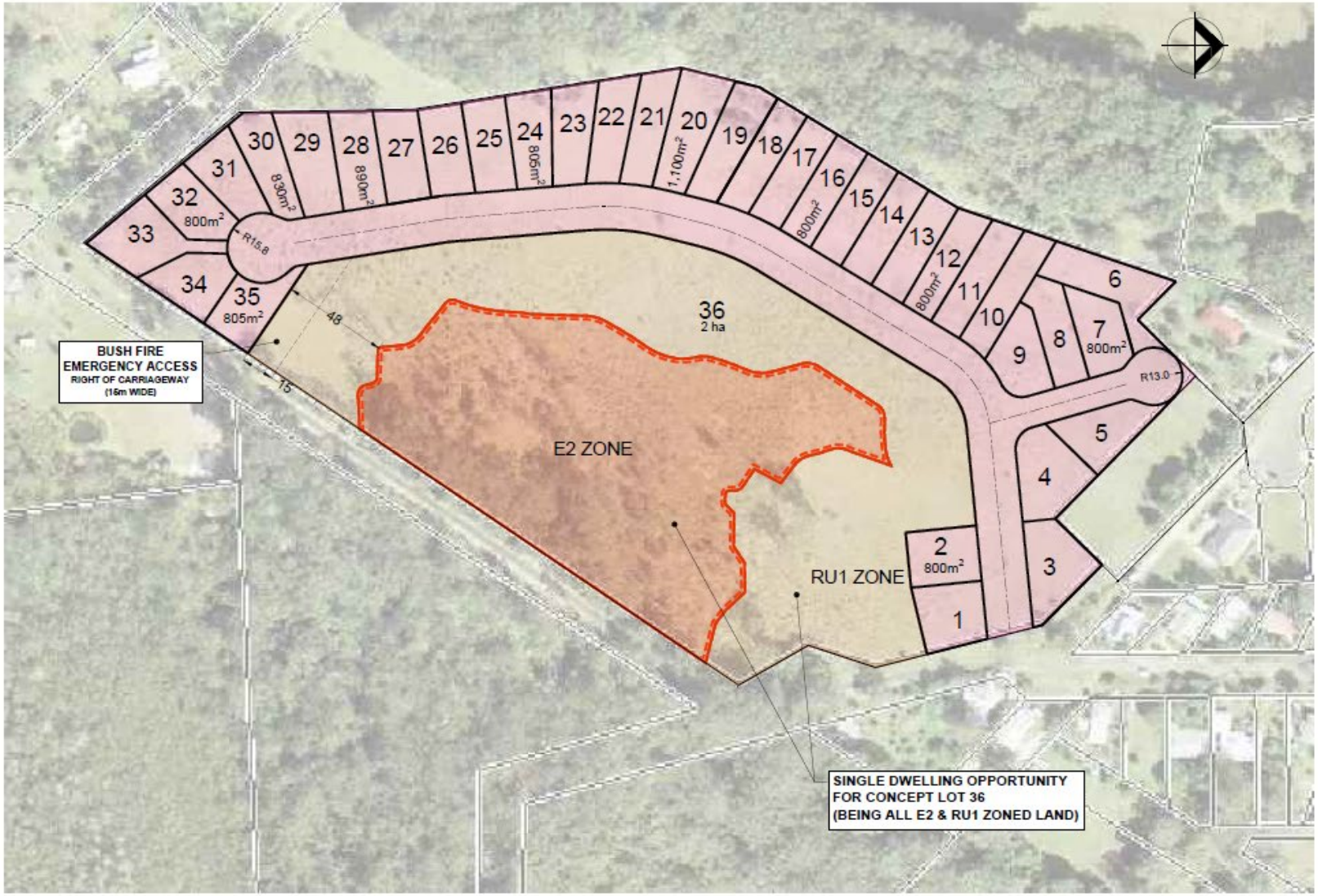
## REFERENCES

NSW Rural Fire Service and Planning NSW (2006), *Planning for bushfire protection, A guide for councils planners fire authorities developers and homeowners.* Rural Fire Service NSW Australia.
Standards Australia, (2009), AS3959 *Construction of buildings in bushfire prone areas,* Australian Standards, Sydney.
NSW Rural Fire Service and Planning NSW (2019), *Planning for bushfire protection, A guide for councils planners fire authorities developers and homeowners.* Rural Fire Service NSW Australia.
Standards Australia, (2018), AS3959 *Construction of buildings in bushfire prone areas,* Australian Standards, Sydney.

## LEGISLATION

Environmental Planning and Assessment Act 1979 and Regulations 2000. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.
Rural Fires Act 1997. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.
Rural Fires Regulation. *New South Wales.* Parliamentary Counsel's Office, NSW Government Information Service.

## APPENDIX A: Conceptual subdivision layout plan




TOTAL LOTS = 36

| | |
|---|---|
| 41,736 m² | RU5 ZONE<br>MIN LOT SIZE 800m² |
| 21,436 m² | RU1 ZONE<br>MIN LOT SIZE 2 ha |
| 19,456 m² | E2 ZONE<br>MIN LOT SIZE 2 ha |

This plan is NOT to be used for construction purposes unless it carries the approval stamp of the local authority.

| Issue | Date | Description | App'd |
|---|---|---|---|
| P6 | 02/09/2020 | Amended Lot Layout | |
| P5 | 19/04/20 | Dimensions Amended | |
| P4 | 19/04/20 | Dimensions Added | |
| P3 | 25/02/20 | Council Review | |
| P2 | 11/02/20 | Council Review | |
| P1 | 28/05/19 | Council Review | |

Client: Alan Cardy

Project: Proposed Rezoning
Lots 100 DP1201719
Hills Road, Rileys Hill

Title: Concept Subdivision Layout Plan



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|---|---|
| Designed | EMR |
| Drawn | EMR |
| Checked | PS |
| Approved | |
| Scale | 1:1000 @ A1, 1:2000 @ A3 |
| File Name | 8174 SP1-P6 Rev P5 (03-09-2020).dwg |
| Date | APRIL 2019 |
| Datum | AHD |
| Job No. | 8174 |
| Dwg No. | SP1 |
| Issue | P6 |

## APPENDIX B: Asset Protection Zone Requirements - Appendix 4 PBP 2019

# APPENDIX 4

## ASSET PROTECTION ZONE REQUIREMENTS

In combination with other BPMs, a bush fire hazard can be reduced by implementing simple steps to reduce vegetation levels. This can be done by designing and managing landscaping to implement an APZ around the property.

Careful attention should be paid to species selection, their location relative to their flammability, minimising continuity of vegetation (horizontally and vertically), and ongoing maintenance to remove flammable fuels (leaf litter, twigs and debris).

This Appendix sets the standards which need to be met within an APZ.

### A4.1 Asset Protection Zones

An APZ is a fuel-reduced area surrounding a building or structure. It is located between the building or structure and the bush fire hazard.

For a complete guide to APZs and landscaping, download the NSW RFS document *Standards for Asset Protection Zones* at the NSW RFS Website www.rfs.nsw.gov.au.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows for suppression of fire;
- an area from which backburning or hazard reduction can be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Bush fire fuels should be minimised within an APZ. This is so that the vegetation within the zone does not provide a path for the spread of fire to the building, either from the ground level or through the tree canopy.

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the building;
- damage to the building asset from intense radiant heat; and
- ember attack.

The methodology for calculating the required APZ distance is contained within Appendix 1. The width of the APZ required will depend upon the development type and bush fire threat. APZs for new development are set out within Chapters 5, 6 and 7 of this document.

In forest vegetation, the APZ can be made up of an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

### A4.1.1 Inner Protection Areas (IPAs)

The IPA is the area closest to the building and creates a fuel-managed area which can minimise the impact of direct flame contact and radiant heat on the development and act as a defendable space. Vegetation within the IPA should be kept to a minimum level. Litter fuels within the IPA should be kept below 1cm in height and be discontinuous.

In practical terms the IPA is typically the curtilage around the building, consisting of a mown lawn and well maintained gardens.

When establishing and maintaining an IPA the following requirements apply:

**Trees**

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m; and
- preference should be given to smooth barked and evergreen trees.

**Shrubs**

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

**Grass**

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

### A4.1.2 Outer Protection Areas (OPAs)

An OPA is located between the IPA and the unmanaged vegetation. It is an area where there is maintenance of the understorey and some separation in the canopy. The reduction of fuel in this area aims to decrease the intensity of an approaching fire and restricts the potential for fire spread from crowns; reducing the level of direct flame, radiant heat and ember attack on the IPA.

Because of the nature of an OPA, they are only applicable in forest vegetation.

When establishing and maintaining an OPA the following requirements apply:

**Trees**

- tree canopy cover should be less than 30%; and
- canopies should be separated by 2 to 5m.

**Shrubs**

- shrubs should not form a continuous canopy; and
- shrubs should form no more than 20% of ground cover.

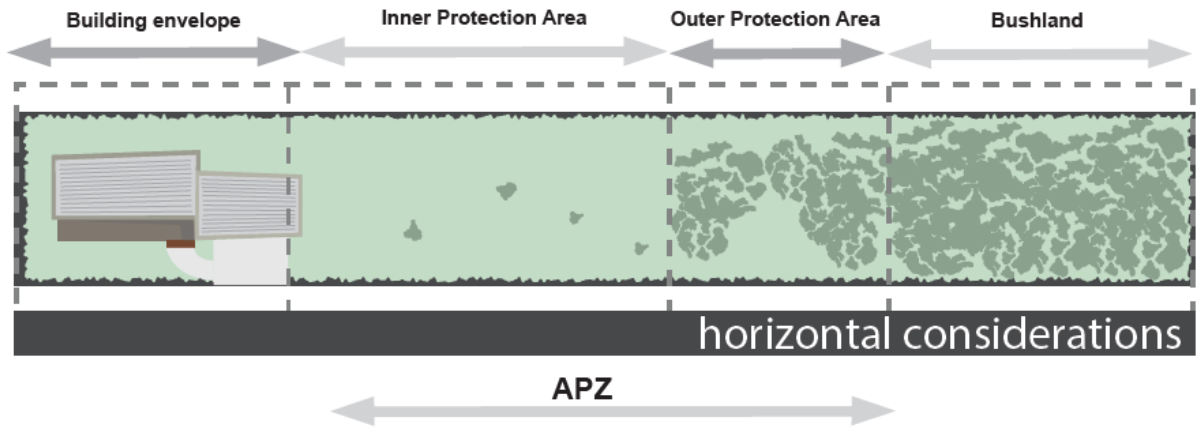
**Grass**

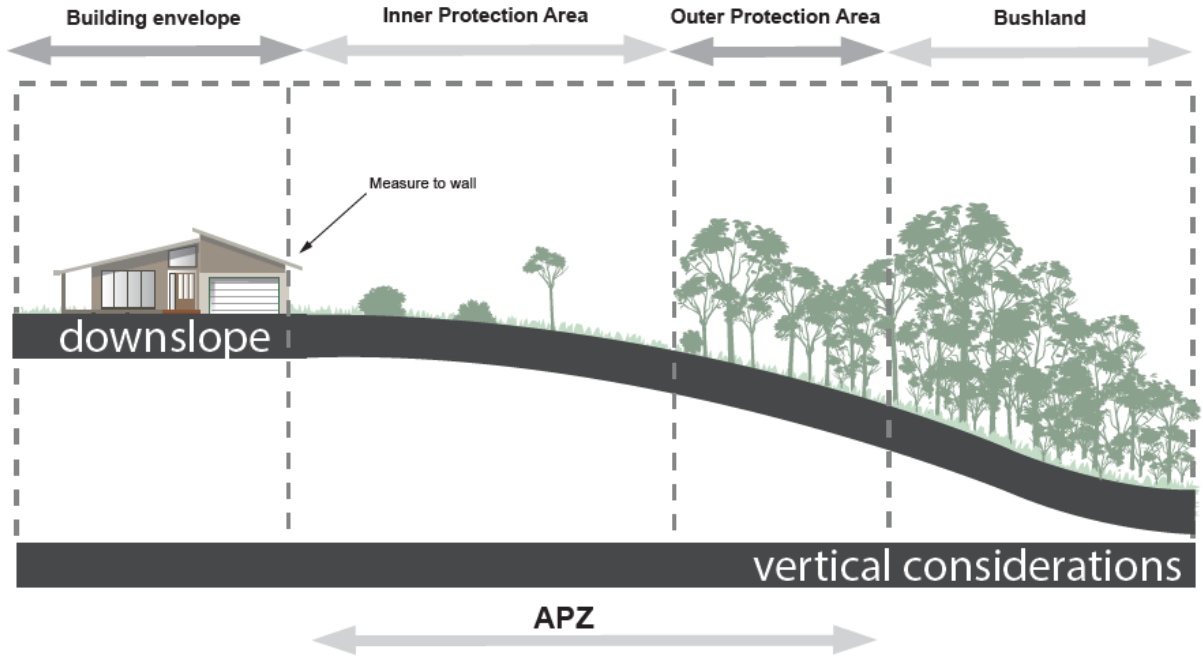
- grass should be kept mown to a height of less than 100mm; and
- leaf and other debris should be removed.

An APZ should be maintained in perpetuity to ensure ongoing protection from the impact of bush fires. Maintenance of the IPA and OPA as described above should be undertaken regularly, particularly in advance of the bush fire season.

**Figure A4.1**

Typical Inner and Outer Protection Areas.



## APPENDIX C: Standards for Asset Protection Zones (RFS 2005)

# standards

## for asset protection zones

protection

NSW RURAL FIRE SERVICE

## STANDARDS FOR ASSET PROTECTION ZONES

## INTRODUCTION

For thousands of years bush fires have been a natural part of the Australian landscape. They are inevitable and essential, as many Australian plants and animals have adapted to fire as part of their life cycle.

In recent years developments in bushland areas have increased the risk of bush fires harming people and their homes and property. But landowners can significantly reduce the impact of bush fires on their property by identifying and minimising bush fire hazards. There are a number of ways to reduce the level of hazard to your property, but one of the most important is the creation and maintenance of an Asset Protection Zone (APZ).

A well located and maintained APZ should be used in conjunction with other preparations such as good property maintenance, appropriate building materials and developing a family action plan.

## WHAT IS AN ASSET PROTECTION ZONE?

An Asset Protection Zone (APZ) is a fuel reduced area surrounding a built asset or structure. This can include any residential building or major building such as farm and machinery sheds, or industrial, commercial or heritage buildings.

An APZ provides:

- a buffer zone between a bush fire hazard and an asset;
- an area of reduced bush fire fuel that allows suppression of fire;
- an area from which backburning may be conducted; and
- an area which allows emergency services access and provides a relatively safe area for firefighters and home owners to defend their property.

Potential bush fire fuels should be minimised within an APZ. This is so that the vegetation within the planned zone does not provide a path for the transfer of fire to the asset either from the ground level or through the tree canopy.

## WHAT WILL THE APZ DO?

An APZ, if designed correctly and maintained regularly, will reduce the risk of:

- direct flame contact on the asset;
- damage to the built asset from intense radiant heat; and
- ember attack on the asset.

## WHERE SHOULD I PUT AN APZ?

An APZ is located between an asset and a bush fire hazard.

The APZ should be located wholly within your land. You cannot undertake any clearing of vegetation on a neighbour's property, including National Park estate, Crown land or land under the management of your local council, unless you have written approval.

If you believe that the land adjacent to your property is a bush fire hazard and should be part of an APZ, you can have the matter investigated by contacting the NSW Rural Fire Service (RFS).

There are six steps to creating and maintaining an APZ. These are:

1. Determine if an APZ is required;
2. Determine what approvals are required for constructing your APZ;
3. Determine the APZ width required;
4. Determine what hazard reduction method is required to reduce bush fire fuel in your APZ;
5. Take measures to prevent soil erosion in your APZ; and
6. Landscape and regularly monitor in your APZ for fuel regrowth.

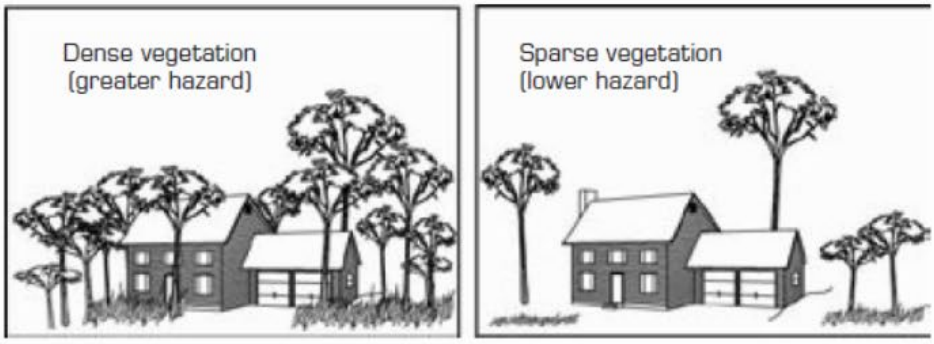
## STEP 1. DETERMINE IF AN APZ IS REQUIRED

Recognising that a bush fire hazard exists is the first step in developing an APZ for your property.

If you have vegetation close to your asset and you live in a bush fire prone or high risk area, you should consider creating and maintaining an APZ.

Generally, the more flammable and dense the vegetation, the greater the hazard will be. However, the hazard potential is also influenced by factors such as slope.

- A large area of continuous vegetation on sloping land may increase the potential bush fire hazard.
- The amount of vegetation around a house will influence the intensity and severity of a bush fire.
- The higher the available fuel the more intense a fire will be.

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Isolated areas of vegetation are generally not a bush fire hazard, as they are not large enough to produce fire of an intensity that will threaten dwellings.

This includes:

- bushland areas of less than one hectare that are isolated from large bushland areas; and
- narrow strips of vegetation along road and river corridors.

If you are not sure if there is a bush fire hazard in or around your property, contact your local NSW Rural Fire Service Fire Control Centre or your local council for advice.

## STEP 2. DETERMINE WHAT APPROVALS ARE REQUIRED FOR CONSTRUCTING YOUR APZ

If you intend to undertake bush fire hazard reduction works to create or maintain an APZ you must gain the written consent of the landowner.

**Subdivided land or construction of a new dwelling**
If you are constructing an APZ for a new dwelling you will need to comply with the requirements in *Planning for Bushfire Protection*. Any approvals required will have to be obtained as part of the Development Application process.

**Existing asset**
If you wish to create or maintain an APZ for an existing structure you may need to obtain an environmental approval. The RFS offers a free environmental assessment and certificate issuing service for essential hazard reduction works. For more information see the RFS document *Application Instructions for a Bush Fire Hazard Reduction Certificate* or contact your local RFS Fire Control Centre to determine if you can use this approval process.

Bear in mind that all work undertaken must be consistent with any existing land management agreements (e.g. a conservation agreement, or property vegetation plan) entered into by the property owner.

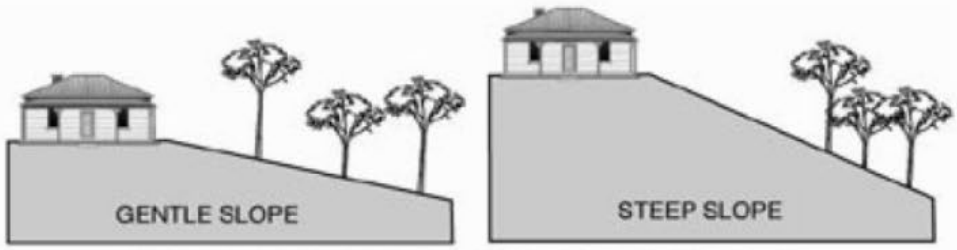
If your current development consent provides for an APZ, you do not need further approvals for works that are consistent with this consent.

If you intend to burn off to reduce fuel levels on your property you may also need to obtain a Fire Permit through the RFS or NSW Fire Brigades. See the RFS document *Before You Light That Fire* for an explanation of when a permit is required.

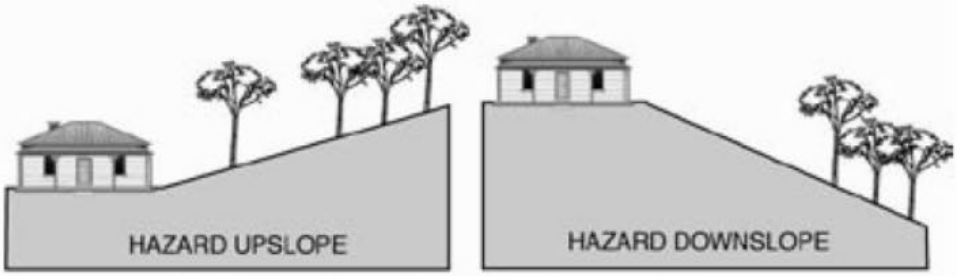
## STEP 3. DETERMINE THE APZ WIDTH

The size of the APZ required around your asset depends on the nature of the asset, the slope of the area, the type and structure of nearby vegetation and whether the vegetation is managed.

Fires burn faster uphill than downhill, so the APZ will need to be larger if the hazard is downslope of the asset. 5




Gentle slopes require a smaller APZ distance than steep slopes




A hazard downslope will require a greater APZ distance then a hazard upslope of the asset

Different types of vegetation (for example, forests, rainforests, woodlands, grasslands) behave differently during a bush fire. For example, a forest with shrubby understorey is likely to result in a higher intensity fire than a woodland with a grassy understorey and would therefore require a greater APZ width.

A key benefit of an APZ is that it reduces radiant heat and the potential for direct flame contact on homes and other buildings. Residential dwellings require a wider APZ than sheds or stockyards because the dwelling is more likely to be used as a refuge during bush fire.

**Subdivided land or construction of a new dwelling**
If you are constructing a new asset, the principles of *Planning for Bushfire Protection* should be applied. Your Development Application approval will detail the exact APZ distance required.

**Existing asset**
If you wish to create an APZ around an existing asset and you require environmental approval, the Bush Fire Environmental Assessment Code provides a streamlined assessment process. Your Bush Fire Hazard Reduction Certificate (or alternate environmental approval) will specify the maximum APZ width allowed.

For further information on APZ widths see *Planning for Bushfire Protection* or the *Bush Fire Environmental Assessment Code* (available on the RFS website), or contact your local RFS Fire Control Centre.

## STEP 4. DETERMINE WHAT HAZARD REDUCTION METHOD IS REQUIRED TO REDUCE BUSH FIRE FUEL IN YOUR APZ

The intensity of bush fires can be greatly reduced where there is little to no available fuel for burning. In order to control bush fire fuels you can reduce, remove or change the state of the fuel through several means.

Reduction of fuel does not require removal of all vegetation, which would cause environmental damage. Also, trees and plants can provide you with some bush fire protection from strong winds, intense heat and flying embers (by filtering embers) and changing wind patterns. Some ground cover is also needed to prevent soil erosion.

**Fuels can be controlled by:**

**1. raking or manual removal of fine fuels**
Ground fuels such as fallen leaves, twigs (less than 6 mm in diameter) and bark should be removed on a regular basis. This is fuel that burns quickly and increases the intensity of a fire.



Fine fuels can be removed by hand or with tools such as rakes, hoes and shovels.

**2. mowing or grazing of grass**
Grass needs to be kept short and, where possible, green.

**3. removal or pruning of trees, shrubs and understorey**
The control of existing vegetation involves both selective fuel reduction (removal, thinning and pruning) and the retention of vegetation.

Prune or remove trees so that you do not have a continuous tree canopy leading from the hazard to the asset. Separate tree crowns by two to five metres. A canopy should not overhang within two to five metres of a dwelling.

Native trees and shrubs should be retained as clumps or islands and should maintain a covering of no more than 20% of the area.

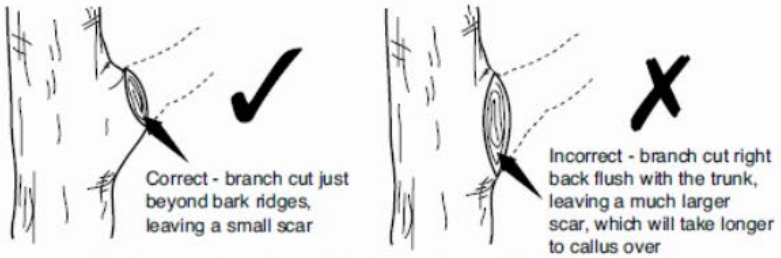
When choosing plants for removal, the following basic rules should be followed:

1. Remove noxious and environmental weeds first. Your local council can provide you with a list of environmental weeds or 'undesirable species'. Alternatively, a list of noxious weeds can be obtained at **www.agric.nsw.gov.au/noxweed/**;
2. Remove more flammable species such as those with rough, flaky or stringy bark; and
3 Remove or thin understorey plants, trees and shrubs less than three metres in height

The removal of significant native species should be avoided.

Prune in acordance with the following standards:

- Use sharp tools. These will enable clean cuts and will minimise damage to the tree.
- Decide which branches are to be removed before commencing work. Ensure that you maintain a balanced, natural distribution of foliage and branches.
- Remove only what is necessary.
- Cut branches just beyond bark ridges, leaving a small scar.
- Remove smaller branches and deadwood first.




There are three primary methods of pruning trees in APZs:

**1. Crown lifting (skirting)**
Remove the lowest branches (up to two metres from the ground). Crown lifting may inhibit the transfer of fire between the ground fuel and the tree canopy.

**2. Thinning**
Remove smaller secondary branches whilst retaining the main structural branches of the tree. Thinning may minimise the intensity of a fire.

**3. Selective pruning**
Remove branches that are specifically identified as creating a bush fire hazard (such as those overhanging assets or those which create a continuous tree canopy). Selective pruning can be used to prevent direct flame contact between trees and assets.

Your Bush Fire Hazard Reduction Certificate or local council may restrict the amount or method of pruning allowed in your APZ.

See the *Australian Standard 4373 (Pruning of Amenity Trees)* for more information on tree pruning.

**4. Slashing and trittering**
Slashing and trittering are economical methods of fuel reduction for large APZs that have good access. However, these methods may leave large amounts of slashed fuels (grass clippings etc) which, when dry, may become a fire hazard. For slashing or trittering to be effective, the cut material must be removed or allowed to decompose well before summer starts.

If clippings are removed, dispose of them in a green waste bin if available or compost on site (dumping clippings in the bush is illegal and it increases the bush fire hazard on your or your neighbour's property).

Although slashing and trittering are effective in inhibiting the growth of weeds, it is preferable that weeds are completely removed.

Care must be taken not to leave sharp stakes and stumps that may be a safety hazard.

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**5. Ploughing and grading**
Ploughing and grading can produce effective firebreaks. However, in areas where this method is applied, frequent maintenance may be required to minimise the potential for erosion. Loose soil from ploughed or graded ground may erode in steep areas, particularly where there is high rainfall and strong winds.

**6. Burning (hazard reduction burning)**
Hazard reduction burning is a method of removing ground litter and fine fuels by fire. Hazard reduction burning of vegetation is often used by land management agencies for broad area bush fire control, or to provide a fuel reduced buffer around urban areas.

Any hazard reduction burning, including pile burns, must be planned carefully and carried out with extreme caution under correct weather conditions. Otherwise there is a real danger that the fire will become out of control. More bush fires result from escaped burning off work than from any other single cause.

**It is YOUR responsibility to contain any fire lit on your property. If the fire escapes your property boundaries you may be liable for the damage it causes.**

Hazard reduction burns must therefore be carefully planned to ensure that they are safe, controlled, effective and environmentally sound. There are many factors that need to be considered in a burn plan. These include smoke control, scorch height, frequency of burning and cut off points (or control lines) for the fire. For further information see the RFS document *Standards for Low Intensity Bush Fire Hazard Reduction Burning*, or contact your local RFS for advice.

**7. Burning (pile burning)**
In some cases, where fuel removal is impractical due to the terrain, or where material cannot be disposed of by the normal garbage collection or composted on site, you may use pile burning to dispose of material that has been removed in creating or maintaining an APZ.

For further information on pile burning, see the RFS document *Standards for Pile Burning*.

In areas where smoke regulations control burning in the open, you will need to obtain a Bush Fire Hazard Reduction Certificate or written approval from Council for burning. During the bush fire danger period a Fire Permit will also be required. See the RFS document *Before You Light that Fire* for further details.

## STEP 5. TAKE MEASURES TO PREVENT SOIL EROSION

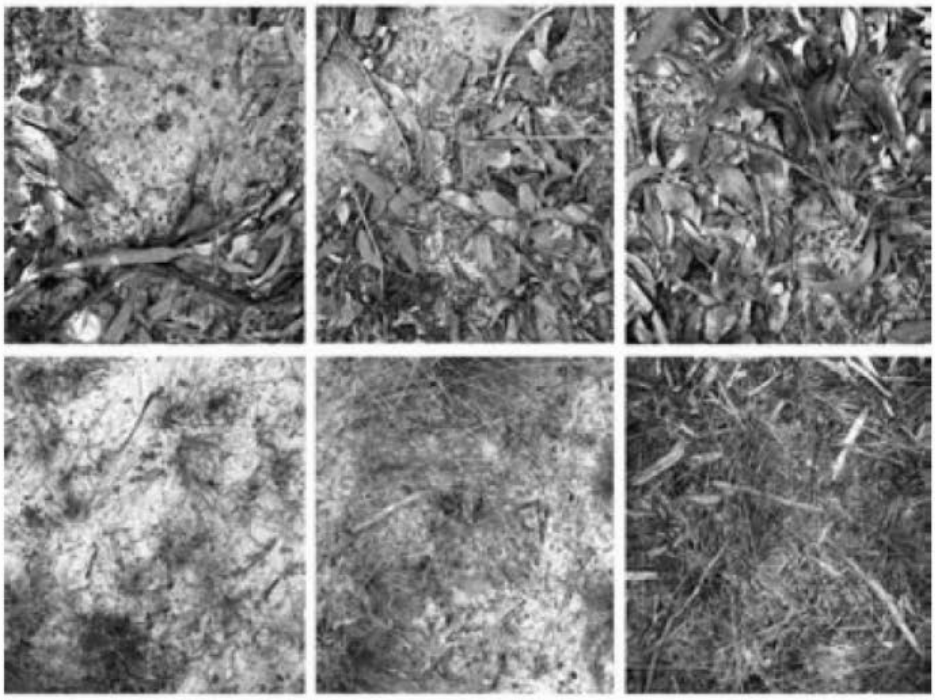
While the removal of fuel is necessary to reduce a bush fire hazard, you also need to consider soil stability, particularly on sloping areas.

Soil erosion can greatly reduce the quality of your land through:

- loss of top soil, nutrients, vegetation and seeds
- reduced soil structure, stability and quality
- blocking and polluting water courses and drainage lines

A small amount of ground cover can greatly improve soil stability and does not constitute a significant bush fire hazard. Ground cover includes any material which directly covers the soil surface such as vegetation, twigs, leaf litter, clippings or rocks. A permanent ground cover should be established (for example, short grass). This will provide an area that is easy to maintain and prevent soil erosion.

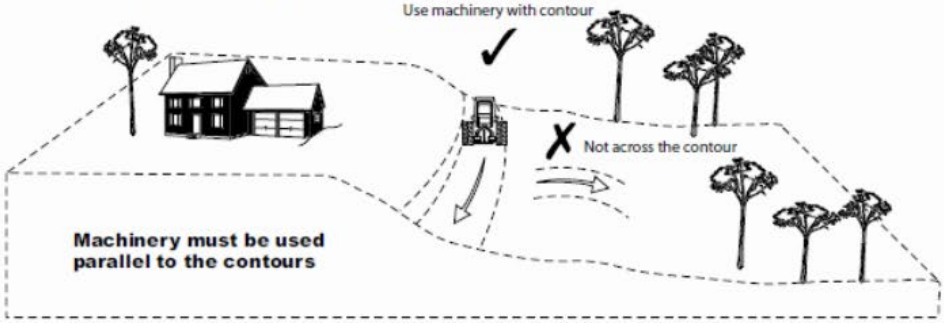
When using mechanical hazard reduction methods, you should retain a ground cover of at least 75% to prevent soil erosion. However, if your area is particularly susceptible to soil erosion, your Hazard Reduction Certificate may require that 90% ground cover be retained.



**50%** **75%** **100%**

Ground Cover

To reduce the incidence of soil erosion caused by the use of heavy machinery such as ploughs, dozers and graders, machinery must be used parallel to the contours. Vegetation should be allowed to regenerate, but be managed to maintain a low fuel load.

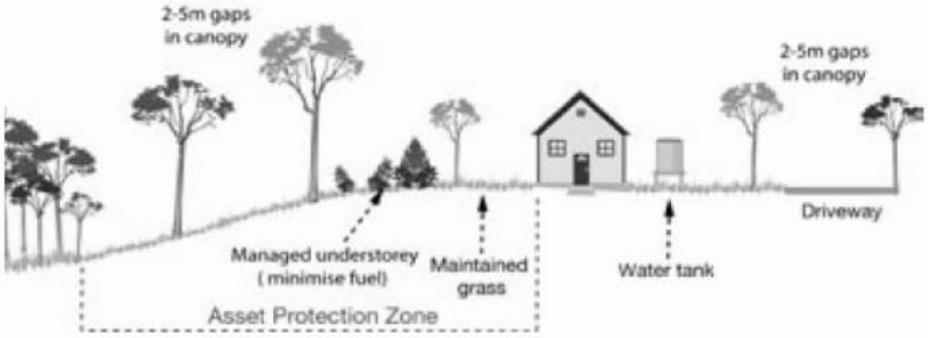


## STEP 6. ONGOING MANAGEMENT AND LANDSCAPING

Your home and garden can blend with the natural environment and be landscaped to minimise the impact of fire at the same time. To provide an effective APZ, you need to plan the layout of your garden to include features such as fire resistant plants, radiant heat barriers and windbreaks.

**Layout of gardens in an APZ**
When creating and maintaining a garden that is part of an APZ you should:

- ensure that vegetation does not provide a continuous path to the house;
- remove all noxious and environmental weeds;
- plant or clear vegetation into clumps rather than continuous rows;
- prune low branches two metres from the ground to prevent a ground fire from spreading into trees;
- locate vegetation far enough away from the asset so that plants will not ignite the asset by direct flame contact or radiant heat emission;
- plant and maintain short green grass around the house as this will slow the fire and reduce fire intensity. Alternatively, provide non-flammable pathways directly around the dwelling;
- ensure that shrubs and other plants do not directly abut the dwelling. Where this does occur, gardens should contain low-flammability plants and non flammable ground cover such as pebbles and crush tile; and
- avoid erecting brush type fencing and planting "pencil pine" type trees next to buildings, as these are highly flammable.




**Removal of other materials**
Woodpiles, wooden sheds, combustible material, storage areas, large quantities of garden mulch, stacked flammable building materials etc. should be located away from the house. These items should preferably be located in a designated cleared location with no direct contact with bush fire hazard vegetation.

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**Other protective features**
You can also take advantage of existing or proposed protective features such as fire trails, gravel paths, rows of trees, dams, creeks, swimming pools, tennis courts and vegetable gardens as part of the property's APZ.

## PLANTS FOR BUSH FIRE PRONE GARDENS

When designing your garden it is important to consider the type of plant species and their flammability as well as their placement and arrangement.

Given the right conditions, all plants will burn. However, some plants are less flammable than others.

Trees with loose, fibrous or stringy bark should be avoided. These trees can easily ignite and encourage the ground fire to spread up to, and then through, the crown of the trees.

Plants that are less flammable, have the following features:

- high moisture content
- high levels of salt
- low volatile oil content of leaves
- smooth barks without "ribbons" hanging from branches or trunks; and
- dense crown and elevated branches.

When choosing less flammable plants, be sure not to introduce noxious or environmental weed species into your garden that can cause greater long-term environmental damage.

For further information on appropriate plant species for your locality, contact your local council, plant nurseries or plant society.

If you require information on how to care for fire damaged trees, refer to the Firewise brochure *Trees and Fire Resistance; Regeneration and care of fire damaged trees.*

## WIND BREAKS

Rows of trees can provide a wind break to trap embers and flying debris that could otherwise reach the house or asset.

You need to be aware of local wind conditions associated with bush fires and position the wind break accordingly. Your local RFS Fire Control Centre can provide you with further advice.

When choosing trees and shrubs, make sure you seek advice as to their maximum height. Their height may vary depending on location of planting and local conditions. As a general rule, plant trees at the same distance away from the asset as their maximum height.

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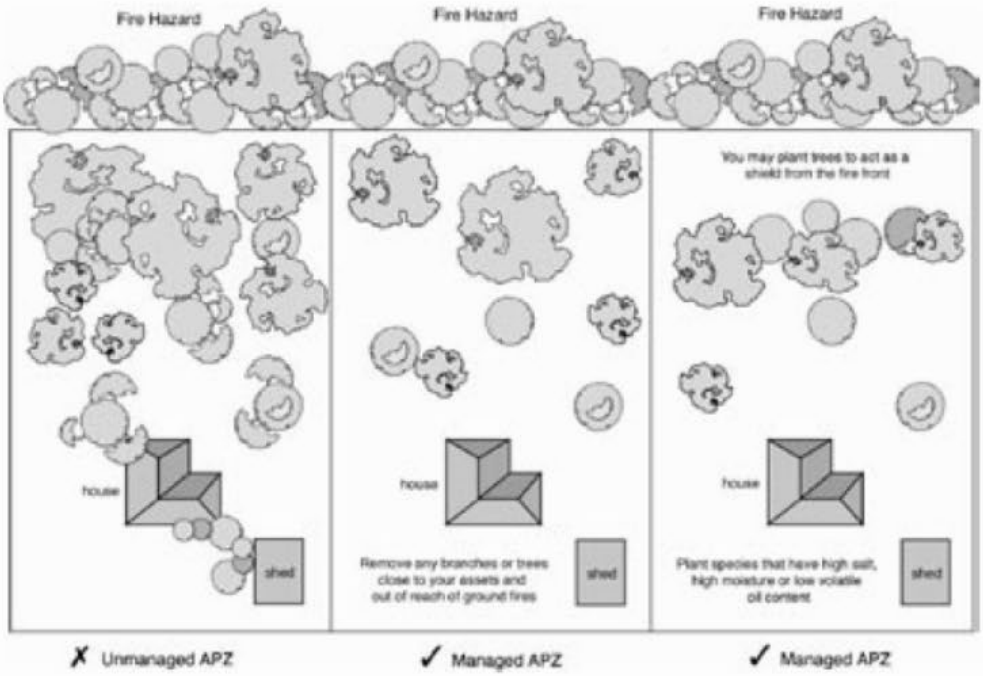
When creating a wind break, remember that the object is to slow the wind and to catch embers rather than trying to block the wind. In trying to block the wind, turbulence is created on both sides of the wind break making fire behaviour erratic.



## HOW CAN I FIND OUT MORE?

The following documents are available from your local Fire Control Centre and from the NSW RFS website at **www.rfs.nsw.gov.au.**

- Before You Light That Fire
- Standards for Low Intensity Bush Fire Hazard Reduction Burning
- Standards for Pile Burning
- Application Instructions for a Bush Fire Hazard Reduction Certificate

If you require any further information please contact:

- your local NSW Rural Fire Service Fire Control Centre. Location details are available on the RFS website or
- call the NSW RFS Enquiry Line 1800 679 737 (Monday to Friday, 9am to 5pm), or
- the NSW RFS website at **www.rfs.nsw.gov.au.**

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