

# Appendices

- (a1) does not include the carrying out of any development excluded from the operation of this section by the regulations, and
- (b) is not complying development for the purposes of the *Environmental Planning and Assessment Act 1979*, despite any environmental planning instrument.

(6) In this section:

"special fire protection purpose" means the purpose of the following:

- (a) a school,
- (b) a child care centre,
- (c) a hospital (including a hospital for the mentally ill or mentally disordered),
- (d) a hotel, motel or other tourist accommodation,
- (e) a building wholly or principally used as a home or other establishment for mentally incapacitated persons,
- (f) housing for older people or people with disabilities within the meaning of State Environmental Planning Policy No 5—Housing for Older People or People with a Disability (now SEPP (Seniors Living))
- (g) a group home within the meaning of State Environmental Planning Policy No 9—Group Homes,
- (h) a retirement village,
- (i) any other purpose prescribed by the regulations.

## A1.4 Schedule 4 – EP&A Reg 11 - Bush fire prone land

The following information is required to be included within a planning certificate under section 149 of the EP&A Act:

"If any of the land is bush fire prone land (as defined in the Act), a statement that all or, as the case may be, some of the land is bush fire prone land.

If none of the land is bush fire prone land, a statement to that effect."

## A1.5 Clause 46 - Rural Fires Regulation 2002 - Application for bush fire safety authority

Clause 46(1) of the Rural Fires Regulation 2002, specifies the information requirements for consideration of a bush fire safety authority under section 100B of the RF Act.

- (1) For the purposes of section 100B (4) of the Act, an application for a bush fire safety authority must be in writing and include the following:
  - (a) a description (including the address) of the property on which the development the subject of the application is to be carried out,
  - (b) a classification of the vegetation on and surrounding the property (out to a distance of 140 metres from the boundaries of the property) in accordance

- with the system for classification of vegetation contained in *Planning for Bush Fire Protection*,
- (c) an assessment of the slope of the land on and surrounding the property (out to a distance of 100 metres from the boundaries of the property),
- (d) identification of any significant environmental features on the property,
- (e) the details of any threatened species, population or ecological community identified under the *Threatened Species Conservation Act 1995* that is known to the applicant to exist on the property,
- (f) the details and location of any Aboriginal relic (being a relic within the meaning of the *National Parks and Wildlife Act 1974*) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property,
- (g) a bush fire assessment for the proposed development (including the methodology used in the assessment) that addresses the following matters:
  - (i) the extent to which the development is to provide for setbacks, including APZs,
  - (ii) the siting and adequacy of water supplies for firefighting,
  - (iii) the capacity of public roads in the vicinity to handle increased volumes of traffic in the event of a bush fire emergency,
  - (iv) whether or not public roads in the vicinity that link with the fire trail network have two-way access,
  - (v) the adequacy of arrangements for access to and egress from the development site for the purposes of an emergency response,
  - (vi) the adequacy of bush fire maintenance plans and fire emergency procedures for the development site,
  - (vii) the construction standards to be used for building elements in the development,
  - (viii) the adequacy of sprinkler systems and other fire protection measures to be incorporated into the development,
- (h) an assessment of the extent to which the proposed development conforms with or deviates from the standards, specific objectives and performance criteria set out in Chapter 4 (Performance Based Controls) of *Planning for Bush Fire Protection*.

## A1.6 Clause 46A - Rural Fires Regulation 2002 - Development excluded from requirements for bush fire safety authority

- (1) For the purposes of section 100B (5) (a1) of the Act, the following development is excluded from the operation of that section:
  - (a) development for the purposes of licensed premises that do not provide overnight accommodation (other than for the owner or manager of the premises),

- (b) strata subdivision of a building, but only if development consent for the erection of the building was granted in accordance with section 79BA of the *Environmental Planning and Assessment Act 1979*,
- (c) strata subdivision of a class 2 building erected before 1 August 2002, but only if the building complies with the requirements of Level 1 construction under AS 3959-1999, *Construction in Bushfire Prone Areas*,
- (d) subdivision of land for the purposes of converting an existing dwelling to a dual occupancy, but only if development consent for the dwelling was granted in accordance with section 79BA of the *Environmental Planning and Assessment Act 1979*,
- (e) subdivision of land (including any boundary adjustments) that is leased under the *Western Lands Act 1901*,
- (f) subdivision for the purposes of consolidations of lots or boundary adjustments on land where the number of lots are reduced, but only if any existing dwelling on the land complies with the requirements of Appendix 3 (Site Bush Fire Attack Assessment) of *Planning for Bush Fire Protection*,
- (g) development for the purposes of bed and breakfast accommodation using an existing building, but only if the building is more than 30 metres from native vegetation,
- (h) subdivision of land used or proposed to be used for industrial purposes on which the erection of a dwelling related to the industrial use of the land (such as a manager's residence) is permitted,
- (i) subdivision of land for a rural residential purpose in a Western New South Wales district, but only if:
  - (i) no lot created by the subdivision is greater than 10 hectares, and
  - (ii) the bush fire prone land in any lot is less than 10 per cent of the lot, and
  - (iii) each lot has direct access to an existing public road.

- (2) In this clause:  
**class**, in relation to a building, means a building of the specified class under the *Building Code of Australia*.

*Building Code of Australia* has the same meaning as it has in the *Environmental Planning and Assessment Act 1979*.

**Western New South Wales district** means any of the following weather forecast districts referred to in Schedule 1:

- (a) Upper Western Weather Forecast District,
- (b) Lower Western Weather Forecast District,
- (c) Riverina Weather Forecast District,
- (d) South West Slopes Weather Forecast District,
- (e) Central West Plains Weather Forecast District,
- (f) Central West Slopes Weather Forecast District,
- (g) Central Tablelands Weather Forecast District,

- (h) North West Plains Weather Forecast District,
- (i) North West Slopes Weather Forecast District.

### **A1.7 Clause 46B - Rural Fires Regulation 2002 - Additional special fire protection purposes for which bush fire safety authority required**

For the purposes of paragraph (i) of the definition of *special fire protection purpose* in section 100B (6) of the Act, the following purposes are prescribed:

- (a) manufactured home estates (within the meaning of *State Environmental Planning Policy No 36—Manufactured Home Estates*), comprising two or more caravans or manufactured homes, used for the purpose of casual or permanent accommodation (but not tourist accommodation),
- (b) sheltered workshops, or other workplaces, established solely for the purpose of employing persons with disabilities,
- (c) respite care centres, or similar centres, that accommodate persons with a physical or mental disability or provide respite for carers of such persons,
- (d) student or staff accommodation associated with a school, university or other educational establishment.

### **A1.8 Classifications (of Buildings) – Volume 1, Building Code of Australia (2006)**

The Building Code of Australia is updated annually and classes of buildings should be confirmed within the latest version of the Code. Buildings are classified as being from Classes 1 to 10.

For the purposes of *Planning for Bush Fire Protection*, the descriptions of the various Classes within the document apply to the 2006 version of the Code.

Classes 1, 2, 3 and 4 are buildings primarily used as a residence.

Classes 5, 6, 7 and 8 are buildings used as shops, warehouses, factories, offices and carparks and the like.

Class 9 buildings include health care, assembly buildings and aged care buildings.

Class 10 buildings are non-habitable building such as a shed as well as fences, free standing walls and swimming pools.

Importantly, Class 3 (other than a detention centre) and Classes 9a and 9c buildings will be a special fire protection purpose for the purposes of section 100B of the *Rural Fires Act 1997*. Other classes of buildings can be assessed under the provisions of section 79BA of the *Environmental Planning and Assessment Act, 1979*.

## Appendix 2

### Determining Asset Protection Zones

#### A2.1 Introduction

This Appendix shows how APZs are determined for residential and rural-residential subdivision and new special fire protection purposes. This assessment will determine the minimum setbacks required for habitable buildings in residential purpose developments designated as bush fire prone.

#### A2.2 Terminology

The methodology requires consideration of the following matters, which contribute to bush fire behaviour and radiant heat models:

(i) **Asset Protection Zone (setback)** distances provide for:

- minimal separation for safe firefighting (access to fire front);
- reduced radiant heat;
- reduced influence of convection driven winds;
- reduced ember viability thereby limiting the impact of ember attack; and
- dispersal of smoke which would otherwise severely impact on residents affected by reduced mobility or health issues.

(ii) **Predominant Vegetation** is classified by structure or formation using the system adopted by Keith (2004) and by the general description using Table A2.1. Vegetation types give rise to resultant radiant heat (assumed under unmanaged conditions to represent an extreme scenario as the danger period is the lifetime of any proposed development) and fire behaviour characteristics. There are 12 vegetation formations (with sub-formations) identified in PBP.

(iii) **Effective Slopes** are classified within five slope classes, one being upslope and four being

downslope, ranging from flat to 18 degrees in steps of five degrees. This recognises the reduced rate of spread (ROS) inherent to fire travelling downslope and the restrictions imposed on development by slopes greater than 18 degrees. The effective slope is that slope within the hazard which most significantly affects fire behaviour of the site having regard to the vegetation class found.

(iv) **Fire weather** assessment assumes a credible worst case scenario and an absence of any other mitigating factors relating to aspect or prevailing winds. The 1:50 year fire weather scenario for most of the State was determined as FDI=80, however, a number of areas including the Greater Sydney, Greater Hunter, Illawarra, Far South Coast and Southern Ranges Fire Areas have higher FDIs which are set at 100. This is believed to occur with reasonable frequency in their respective fire areas. The relevant fire areas are set out in Table A2.3.

(v) **Fire intensity (I)** is determined following the formula adapted from Luke and McArthur (1978),  $I = HWr/36$  where H is the heat yield for vegetation, W is fuel load (t/Ha) and r is ROS (km/hr). ROS is normally determined using McArthur Meter Mark V at the relevant FDI for forests and woodlands. Other models are used for heaths and scrubs (Catchpole, et al, 1998). Radiant heat is then derived from flame length and intensity models using the 'view factor' model (Douglas and Tan, 2005).

(vi) **Inner Protection Area (IPA) and Outer Protection Area (OPA)** for forest and woodland vegetation. The IPA is critical to providing a defensible space and managing heat intensities at the building surface. The OPA serves to reduce the potential length of flames by slowing the ROS, filtering embers and reducing the likelihood of crown fire. The IPA may be increased at the expense of OPAs.

For other vegetation types (such as heaths,

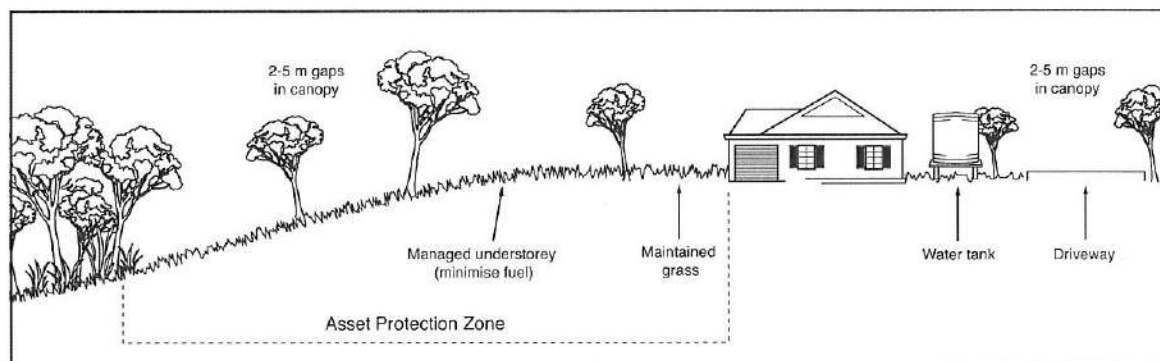


Figure A 2.1 Asset Protection Zone [ setback ] design

rainforests, arid shrublands and semi-arid woodlands), it is not feasible to distinguish between IPAs and OPAs and therefore all such APZs should be managed as IPAs.

An IPA should provide a tree canopy cover of less than 15% and should be located greater than 2 metres from any part of the roofline of a dwelling. Garden beds of flammable shrubs are not to be located under trees and should be no closer than 10 metres from an exposed window or door. Trees should have lower limbs removed up to a height of 2 metres above the ground.

An OPA should provide a tree canopy cover of less than 30% and should have understorey managed (mowed) to treat all shrubs and grasses on an annual basis in advance of the fire season (usually September).

### A2.3 Procedure

The following procedure is to be adopted when assessing a development at a defined precinct level in order to determine whether the development is bush fire prone and if so, which setbacks will be appropriate:

- (a) Determine vegetation formations, as follows:
  - (i) identify all vegetation in all directions from the site for a distance of 140 metres;
  - (ii) consult Table A2.1 to determine the predominant vegetation type; and
  - (iii) select the predominant vegetation formation as described in Table A2.1.
- (b) Determine the effective slope of the land under the Predominant Vegetation Class and the site (slope classes are detailed on page 56).
- (c) Determine the appropriate fire (weather) area in Table A2.3 and note the relevant FDI.
- (d) Consult Tables A2.4–2.7 and determine the appropriate setback for the assessed land use, vegetation group and slope range.

#### (a) Predominant Vegetation Class Formation

Determine the predominant vegetation communities using high resolution (within five

metres) vegetation databases and/or field assessment by qualified persons over a distance of at least 140 metres in all directions from the proposed property boundary or building footprint on the development site. Where a mix of vegetation types exist the type providing the greater hazard is said to predominate. Vegetations descriptions are as per Keith D. 2004 in: "Ocean Shores to Desert Dunes" published by DEC (except heathlands which is provided two sub-formations rather than one based largely on vegetation height). Consideration is to be given to the understorey as this may contain the greater mass of fuels. Do not include vegetation that is to be cleared as part of the development.

For the purposes of this document, vegetation is classified (using the formations and sub-formations within Keith (2004) (see Table A2.1) into:

- forests (wet sclerophyll forests and dry sclerophyll forests);
- woodlands;
- forested wetlands;
- tall heaths;
- freshwater wetlands
- short heaths;
- alpine complex;
- semi-arid woodlands;
- arid shrublands;
- rainforests; and
- grasslands.

Plantations not being native timber plantation (usually pines) are also assessed as being a bush fire hazard with a fuel load of 20t/Ha.

Where fuel loads are to be assessed, PBP has adopted a reliable system of assessing fuel accumulation rates based on canopy cover, years since last fire and shrub layer cover (Forestry Commission of NSW, 1991). This has also been validated with published literature on fuel loads (eg. Good, 1994, Watson, 2005, Cheney and Sullivan,

***PBP does not accept photo comparative assessment techniques as a basis of estimating fuel in forests for land use planning and construction purposes due to the significant variability in interpretation.***

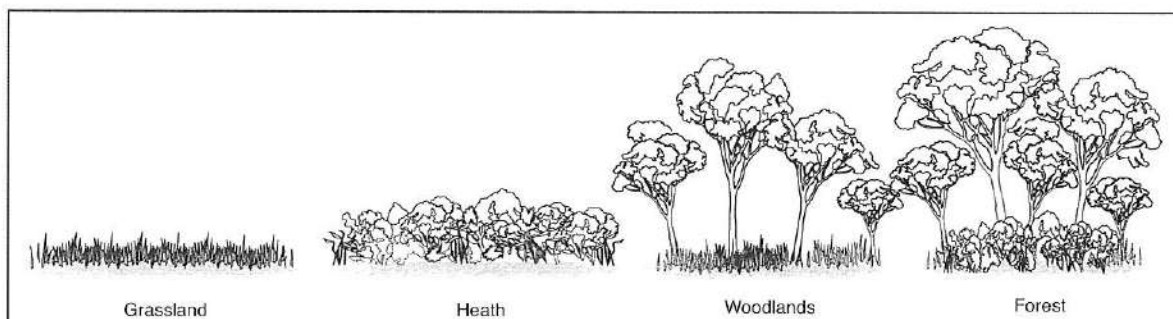


Figure A 2.2 Examples of Vegetation Types used in PBP





Riparian areas



Orchards (reduced vegetation)



Playgrounds (reduced vegetation)



Woodland remnant

Examples of non-vegetated and reduced vegetation areas.

1997, Department of Planning, 1984).

For the purposes of assessing available fuel, the forest fuel is assumed to have accumulated over a period of 20 years and is the loading given for dry sclerophyll forests.

**Recent experiences from bush fires in Central Western NSW have demonstrated that a significant threat can exist for developments in grassland areas. Construction requirements are not specified in relation to grassland areas and these areas may not be mapped as being bush fire prone. Grass fires can threaten the sub floor spaces of a building and may generate significant embers. The RFS supports protection of the sub floor or the integration of 1.8 metre high protective (non combustible) fencing in conjunction with screened windows and a basic APZ of 10 metres for these situations. LEP provisions should address rural properties at threat from crop or grass fires including access, water and the above as a requirement.**

Remnant vegetation is a parcel of vegetation with a size of less than 1 Ha or a shape that provides a potential fire run directly toward buildings not exceeding 50m. These remnants are considered

a low hazard and APZ setbacks and building construction standards for these will be the same as for rainforests. The effective slope is to be determined over the length of the remnant.

Although small remnants, coastal wetlands and riparian areas vary significantly in structure and composition, these areas have been generally assessed as being bush fire hazards, with the exception of saline wetlands that are assessed as being a non-hazard. Riparian areas are those areas of vegetation which are no greater than 20 metres in width and are found on either bank of a river, creek or stream identified on a bush fire prone land map, and are treated the same as rainforests.

**For the purposes of assessment, the following are not considered a hazard or as a predominant vegetation class/formation and can be included within an asset protection zone:**

- (a) non-vegetated areas including roads, footpaths, cycleways, waterways, buildings, rocky outcrops and the like; and
- (b) reduced vegetation including maintained lawns, golf course fairways, playgrounds or sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries.



Rainforests (Closed forest)



Dry sclerophyll forests (Open forest)



Central Western Grasslands



Semi-arid woodlands (Low woodlands)

*Examples of Vegetation Formations of NSW*

Table A2.1 Classification of Vegetation Formations (after Keith, 2004)

Keith (2004) Formations		
Formation class	Formation (Sub formation) Description	F (r)/F(t)* (t/ha)
<b>Rainforests (Closed forest)</b>	Closed and continuous tree canopy composed of relatively soft, horizontally-held leaves. Generally lacking in eucalypts. Understorey typically includes ferns and herbs. Vines often present in canopy or understorey. Occur mainly in areas that are reliably moist, mostly free of fire and have soils of moderate to high fertility. Typically coastal and escarpment locations.	8/10
<b>Wet sclerophyll forests (Tall open forest)</b>	High open tree canopy dominated by tall (typically >30m), straight-trunked eucalypt species. Luxuriant understorey composed of soft leaved shrubs, ferns and herbs. Many understorey plants are rainforest species. Found on moderately fertile soils in areas of high (>900mm) rainfall.	
	<b>Shrubby sub formation</b> Many soft-leaved shrubs and small trees in understorey. Eg. Typically sub-alpine and tableland locations.	25/30
	<b>Grassy sub formation</b> Fewer soft-leaved shrubs allowing a more substantial cover of grasses and herbs on the forest floor. Reflects drier habitat. Eg. Typically coastal and escarpment locations.	20/25
<b>Grassy woodlands (Woodlands)</b>	Dominated by an open to sparse layer of eucalypts (typically boxes and red gums) with the crowns rarely touching (ie <30% foliage cover). Typically 15-35m high (may be shorter at sub-alpine altitudes). Diverse ground cover of grasses and herbs. Long lived perennial tussock grasses form the structural matrix of the understorey. Shrubs are sparsely distributed. Found on fine textured soils of moderate to high fertility, principally on flat to undulating terrain. Rainfall 500-900mm Tablelands, western slopes, and low rainfall coastal lowlands.	10/15
<b>Grasslands</b>	Dominated by large perennial tussock grasses and the presence of broad-leaved herbs in the inter-tussock spaces. Lack of woody plants. Associated with fertile heavy clay soils on flat topography on in regions with low to moderate rainfall. Plants include grasses, daisies, legumes, geraniums, saltbushes and copperburrs.	6
<b>Dry sclerophyll forests (Open forest)</b>	Dominated by eucalypts 10-30m tall with crowns that touch or overlap (ie foliage cover of 20-50%). Prominent layer of hard-leaved shrubs. Infertile soils. Rainfall >500mm. Coast, tablelands and western slopes.	
	<b>Shrub/grass sub formation</b> Conspicuous presence of grasses in the understorey. Also have a significant shrub component, including a mixture of hard leaved and soft-leaved plants. Includes native timber plantations.	20/25
	<b>Shrubby sub formation</b> Understorey dominated by shrubs including waratahs, banksias, spider flowers, wattles, pea-flowers, gum trees, tea-trees, native fuschias, boronias and wax flowers. Sparse ground cover comprised mainly of hard-leaved sedges. Found on sandy infertile soils on exposed sites.	20/25
<b>Heathlands (Shrublands)</b>	Shrubby vegetation. Principal plant species include banksias, spider flowers, wattles, legumes, eucalypts, tea-trees, paper barks, sheoaks, grass trees, cord rushes and sedges. Grasses are scarce. Found on infertile soils and is dependant on fire. Not found in arid and semi arid locations.	



Table A2.1 Classification of Vegetation Formations (after Keith, 2004)

Formation class	Formation (Sub formation) Description	F (r)/F(t)* (t/ha)
<b>Heathlands (Shrublands)</b>	<b>Tall Heaths (Scrub)</b> Heathlands greater than 2 metres tall. Includes Hawkesbury Sandstone vegetation with scattered overstorey trees and predominantly healthy understorey and coastal heath. May include some mallee eucalypts in coastal locations.	25
	<b>Short Heath (Open Shrub)</b> Heathlands less than 2 meters in height. Often more open in canopy.	15
<b>Alpine complex (Sedgeland)</b>	Structural dominance by small-leaved shrubs, herbs and tussocky grasses. Seasonal dormancy and snow tolerance. A lack of trees.	17
<b>Freshwater wetlands</b>	Areas permanently or temporarily inundated either by standing or running water (swamps). Dominated by sedges, shrubs or herbs. Excludes wetlands dominated by trees and those with significant quantities of salt. Coast, tablelands, western slopes and plains.	15
<b>Forested wetlands</b>	Restricted to riverine corridors and floodplains subject to periodic inundation. Dominated by eucalypts, tea-trees and paperbarks or sheoaks. Distinguished by presence of hydrophytes, woody plants that can live in flooded environments eg. sedges, rushes, buttercups, knot weeds, lignum, ferns and grasses. Found generally low altitudes. Soils vary from peaty and semi-humic loam soils to mineral clays and sandy loams. Coast, tablelands, and inland.	15/20
<b>Saline wetlands</b>	Distinguished by an abundance of salt. Halophytes abundant. Eg mangrove swamps, salt marshes and seagrass meadows. Coast (tidal estuaries) and western plains (salt lakes).	-
<b>Semi-arid woodlands (Low woodlands)</b>	Widely spaced tree canopies, trees 5-20m tall. Dominance of sclerophyllous trees (box eucalypts, mallee eucalypts, sheoaks, wattles and cypress pines), drought resistant shrubs and ephemeral grasses and herbs. Rainfall 250-500mm/year. Western plains.	
	<b>Grassy sub formation</b> Occurs on floodplains. Understorey predominantly grassy, although chenopod shrubs may be common in some local areas. Can be distinguished from grassy woodlands by their more ephemeral ground cover and predominant trees and shrubs, all of which have inland distributions.	5/18
	<b>Shrubby sub formation</b> Occurs on more elevated areas or uplands. Shorter trees <15m and less cover of grasses than the grassy formation. Abundant drought resistant shrubs and variable grass cover. Eg. Mallee woodland	8
<b>Arid shrublands</b>	Dominated by drought-tolerant shrubs, including chenopods. Occur where the rainfall or local soil moisture is too low to support tree-dominated vegetation. Rainfall <500mm. Western plains.	
	<b>Chenopod sub formation (Low shrublands)</b> Dominated by low shrubs (mostly <1.5m tall) such as saltbushes, bluebushes and copperburrs. Ground cover of perennial tussock grass (never hummock grass). Found on lime-rich calcareous or saline soils.	9
	<b>Acacia sub formation (Tall shrublands)</b> Shrubs usually taller than 2m, dominated by various acacia species and other large shrubs. May have abundant hummock grass (spinifex) ground cover. Found on silica rich soils. Eg. Mulga shrubland	9

\* Fuel loads are expressed as fuels contributing to rates of spread [F(r)] and total fuel loads [F(t)] that contribute to intensity. Single figures denote same values for both based on bush fire behaviour models.



**(b) Effective Slope**

Assess the slope over a distance of at least 100m from the existing property boundary (for subdivision) or building footprint (for SFPP) on the development site towards the various vegetation communities constituting the hazard. In assessing the slope, it may be found that there are a variety of slopes covering different distances. Determine the gradient within the hazard (vegetation) which will most significantly influence the fire behaviour of the site having regard to vegetation class found.

Slope assessment may be derived from topographic maps displaying 10 metre contour intervals. Where land is being surveyed by a land surveyor, assessments should be based on a minimum of five metre contours.

The slope is determined in terms of the following classes, relative to the location of the hazard:

- (i) all upslope vegetation (considered 0°)
- (ii) >0 to 5° downslope vegetation
- (iii) >5 to 10° downslope vegetation
- (iv) >10 to 15° downslope vegetation
- (v) >15 to 18° downslope vegetation

APZ tables in this Appendix are provided for acceptable solutions with slopes of up to 18 degrees. Effective slopes to be assessed with hazards in excess of 18 degrees will require a detailed performance assessment

**SLOPE COMPARISONS**

Ratio	Degrees	Percentage
1:1	45	100%
1:1.5	34	66%
1:2	26	50%
1:2.5	21	40%
1:3	18	33%
1:3.5	15	28%
1:4	14	25%
1:4.5	12	22%
1:5	11	20%
1:5.5	10	18%
1:6	9	16%
1:6.5	9	15%
1:7	8	14%
1:7.5	8	13%
1:8	7	12%
1:8.5	7	11%
1:9	6	11%
1:10	6	10%
1:11	5	9%
1:12	5	8%
1:13	4	8%
1:14	4	7%
1:15	4	7%
1:16	4	6%
1:17	3	6%
1:18	3	5.5%
1:19	3	5%
1:20	3	5%

Table A 2.2 Slope Comparisons

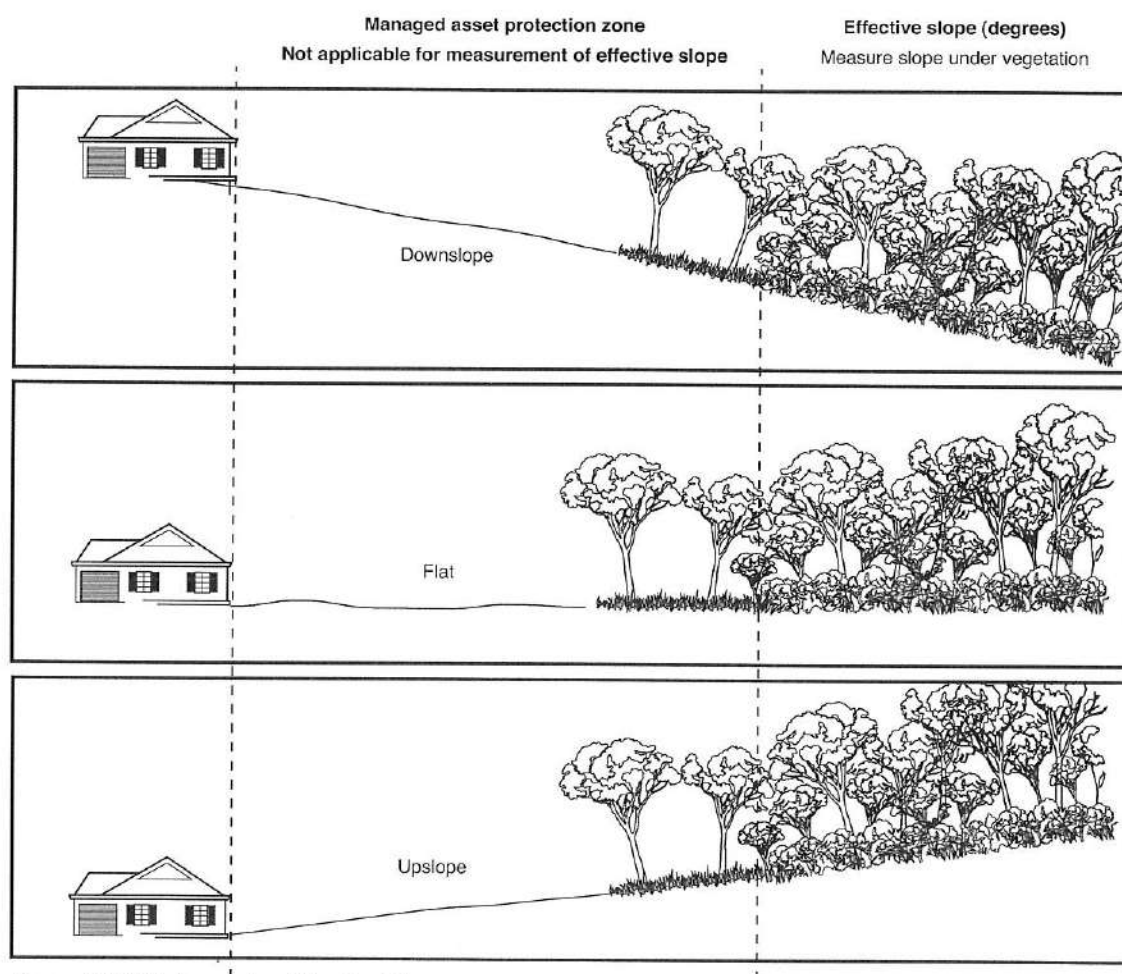


Figure A2.3 Determining Effective Slope

<b>1. FAR NORTH COAST (80)</b> Ballina Byron Clarence Valley Kyogle Lismore Richmond Valley Tweed	<b>8. ACT (N/A)</b> Australian Capital Territory	Narromine Parkes Temora Weddin Wellington
<b>2. NORTH COAST (80)</b> Bellingen Coffs Harbour Gloucester Great Lakes Greater Taree Hastings Kempsey Nambucca	<b>9. SOUTHERN RANGES (100)</b> Palerang Goulburn Mulwaree Queanbeyan Upper Lachlan Yass Valley	<b>16. SOUTHERN SLOPES (80)</b> Boorowa Cootamundra Gundagai Harden Tumbarumba Tumut Young
<b>3. GREATER HUNTER (100)</b> Cessnock Dungog Lake Macquarie Maitland Muswellbrook Newcastle Port Stephens Singleton Upper Hunter	<b>10. CENTRAL RANGES (80)</b> Bathurst Blayney Cabonne Cowra Lithgow Mid Western Regional Oberon Orange	<b>17. EASTERN RIVERINA (80)</b> Albury Coolamon Greater Hume Junee Lockhart Wagga Wagga
<b>4. GREATER SYDNEY REGION (100)</b> All Sydney Metropolitan Councils Plus Gosford, Blue Mountains, Hawkesbury and Wyong	<b>11. NEW ENGLAND (80)</b> Armidale Dumaresq Glen Innes Severn Guyra Tenterfield Uralla Walcha	<b>18. SOUTHERN RIVERINA (80)</b> Berrigan Conargo Corowa Deniliquin Jerilderie Murray Urana Wakool
<b>5. ILLAWARRA/SOALHAVEN (100)</b> Kiama Shellharbour Shoalhaven Wingecarribee Wollondilly Wollongong	<b>12. NORTHERN SLOPES (80)</b> Gunnedah Gwydir Inverell Liverpool Plains Tamworth Regional	<b>19. NORTHERN RIVERINA (80)</b> Carrathool Griffith Hay Leeton Murrumbidgee Narrandera
<b>6. FAR SOUTH COAST (100)</b> Bega Valley Eurobodalla	<b>13. NORTH WESTERN (80)</b> Moree Plains Narrabri Walgett Warrumbungle	<b>20. SOUTH WESTERN (80)</b> Balranald Wentworth
<b>7. MONARO ALPINE (80)</b> Bombala Cooma Monaro Snowy River	<b>14. UPPER CENTRAL WEST PLAINS (80)</b> Bogan Coonamble Gilgandra Warren	<b>21. FAR WESTERN (80)</b> Bourke Brewarrina Broken Hill Central Darling Cobar Unincorporated NSW
	<b>15. LOWER CENTRAL WEST PLAINS (80)</b> Bland Dubbo Forbes Lachlan	

Table A2.3 NSW Fire Areas and associated council areas with appropriate FDI rating assumed as a 1:50 year event.

### (c) Determining Appropriate Fire (Weather) Areas

For residential and rural residential subdivisions locate the site in terms of the local council area (see inside rear cover and Table A2.3) where the development is to be located and determine the appropriate fire areas and corresponding FDI rating. For SFPP's see (d) below.

### (d) Determining Appropriate Asset Protection Zones (APZs)

Consult Tables A2.4 and A2.5 (for subdivisions) for each respective vegetation class and appropriate FDI rating. **These setbacks are based upon the need to conform to Level 3 (except grasslands) construction (AS 3959 – 1999) for a building of Class 1 or 2 under the BCA.**

Grasslands of 100 metres from any boundary (subdivision) or buildings (SFPPs) do not require construction requirements in conformity with AS 3959 – 1999 or this document but requires an APZ of 10 metres for slopes <18°.

If it is intended to construct to a lower bush fire protection standard (e.g. Level 1 or 2) or to no specific bush fire protection standards, Appendix 3 should be consulted for the appropriate setbacks for individual circumstances.

For SFPPs (e.g. SEPP – Seniors Living and Class 3 buildings), Table A2.6 is used. In interpreting the Tables refer to the accompanying notes to these Tables.

Location of APZs on slopes greater than 18 degrees is not supported for new developments on wooded vegetation, due to environmental constraints and difficulties in managing vegetation. In addition, vegetation could carry a canopy fire along these steep slopes where an understorey would otherwise normally be required to support a sustained crown fire.

APZs should be identified on plans for interface allotments by either a building line or building footprint. In some cases building envelopes are identified which include other building constraints. Unless otherwise specified, a building envelope will be taken as the building footprint.

Where the predominant vegetation is removed in establishing the required APZ, the site should be reassessed and the dimensions of the APZ may be adjusted in the light of the remaining predominant vegetation.

Allowable OPAs within an APZs are set out in Table A2.7 for forest vegetation.

**Table A2.4 Minimum Specifications for Asset Protection Zones (m) for Residential and Rural Residential Subdivision Purposes (for Class 1 and 2 buildings) in FDI 100 Fire Areas ( $\leq 29\text{kW/m}^2$ )**

Vegetation Formation	Effective Slopes				
	Upslope/Flat	>0°-5°	>5°-10°	>10°-15°	>15°-18°
Rainforests	10	10	15	20	25
Forests	20	25	35	50	60
Woodland (Grassy)	10	15	20	25	30
Plantations (Pine)	20	25	30	45	50
Tall Heath (Scrub)	15	15	20	20	20
Short Heath (Open Scrub)	10	10	10	15	15
Freshwater Wetlands	10	10	10	15	15
Forested Wetlands	15	20	25	35	45

**Table A2.5 Minimum Specifications for Asset Protection Zones (m) for Residential and Rural Residential Subdivision Purposes (for Class 1 and 2 buildings) in FDI 80 Fire Areas ( $\leq 29\text{kW/m}^2$ )**

Vegetation Formation	Effective Slopes				
	Upslope/Flat	>0°-5°	>5°-10°	>10°-15°	>15°-18°
Rainforests	10	10	15	15	20
Forests	20	20	30	40	45
Woodland	10	15	15	20	25
Plantations (Pine)	15	20	25	35	40
Tall Heath (Scrub)	15	15	20	20	20
Short Heath (Open Scrub)	10	10	10	15	15
Freshwater Wetlands	10	10	10	15	15
Forested Wetlands	15	20	20	30	35
Semi-Arid (Woodland)	10	10	10	10	15
Arid Shrubland	10	10	10	15	15

**Table A2.6 Minimum Specifications for Asset Protection Zones (m) for Special Fire Protection Purposes in bush fire prone areas ( $\leq 10\text{kW/m}^2$ )**

Vegetation Formation	Effective Slopes				
	Upslope/Flat	>0°-5°	>5°-10°	>10°-15°	>15°-18°
Rainforests	30	40	50	60	65
Forests	60	70	85	100	100
Woodland (Grassy)	40	50	60	70	75
Plantations (Pine)	50	60	70	85	95
Tall Heath (Scrub)	45	50	55	60	65
Short Heath (Open Scrub)	35	35	40	45	45
Freshwater Wetlands	35	35	40	45	45
Forested Wetlands	50	60	75	90	95
Semi-Arid (Woodland)	30	35	40	45	50
Arid Shrubland	30	35	40	45	45
Alpine Resorts	(see page 31 and Table A3.5 on page 66)				

**Table A2.7 Determining Allowable Outer Protection Areas (m) for forest vegetation within an APZ**

	Effective Slopes				
	Upslope/Flat	>0°-5°	>5°-10°	>10°-15°	>15°-18°
Forests FDI 100 - subdivision	10	10	15	25	30
Forests FDI 80 - subdivision	10	5	15	20	20
Forests SFPP	20	20	25	30	25

Note: Vegetation Formations based on Keith D. (2004) - see pages 54 - 55

*For Forest Vegetation Formations, APZs can incorporate IPAs and OPAs (see page 50). OPAs to the distances specified in Table A2.7 are allowable subject to meeting the performance requirements for the OPAs. The balance of the APZ is to be managed as an IPA.*

## Appendix 3

### Site Bush Fire Attack Assessment

#### A3.1 Introduction

*Within this appendix, words that are italicised are commentary and do not form part of the requirements for site assessment or the provision of a deemed-to-satisfy solution under the Building Code of Australia (BCA).*

This appendix sets out the site assessment methodology for NSW for determining the required level of construction from Section 3 of AS 3959 that applies to a building in a designated bush fire prone area.

This appendix replaces Section 2 of that Standard. This site assessment methodology forms part of the deemed-to-satisfy provisions of the Building Code of Australia (BCA) for NSW for construction in designated bushfire prone areas.

The term "designated bushfire prone area" is defined in the Building Code of Australia (BCA). NSW has varied the national BCA definition of this term. Refer to the relevant NSW variations in Volumes One and Two of the BCA.

#### A3.2 Application

This site assessment methodology applies to buildings to which the bush fire provisions of the BCA apply.

In NSW the BCA bush fire protection provisions are applied to (via a State variation to the BCA for NSW) Class 1, 2, 3 buildings, Class 4 parts of buildings and Class 9 buildings that are Special Fire Protection Purposes (SFPPs).

*The methodology in this appendix applies as follows:*

- *For new residential dwellings the methodology mirrors that in Appendix 2 for addressing APZ requirements. The assumption is that APZ and construction standards (and other measures) work together and, when subdividing land, the subsequent buildings can be built in accordance with AS 3959.*
- *For SFPPs the methodology should be addressed afresh. In other words, if a formal APZ currently does not exist, distances are to be measured from the boundary of the bush fire hazard to buildings (where the vegetation is maintained in a fuel free condition). An area is described as having a fuel free condition where the vegetation is maintained to the standard required in an APZ, as established in this document.*

- *Generally, no bush fire construction requirements apply to any proposed building located more than 100 metres away from a bush fire hazard.*

#### A3.3 Basis of the site assessment methodology: radiant heat flux and required separation distances

*There are a number of basic concepts underpinning the requirements of PBP. Each is briefly described below:*

##### (a) Radiant heat flux and fire intensity

*Fire intensity is the rate of heat release, per unit length of the fire front, measured in kilowatts per metre (kW/m). It is a function of the heat content and weight of the fuel and the rate of spread of the fire. Radiant heat flux is a measure of heat energy impacting on a surface (kW/m<sup>2</sup>).*

*Research has shown the effects of increasing radiant heat flux on buildings and people. This is shown in Figure A3.1*

##### (b) Fuel loads

*Fuel is any organic matter available for ignition and combustible components include leaves, twigs, bark and residue (J.Gould, 2003). Fuel load is a measure (tonnes per hectare) of the accumulated vegetative matter available to a resultant bush fire.*

*Determination of the protection measures required, is based on an estimation of the maximum hazard which, in turn, is based on maximum possible fuel loads likely to occur on and adjacent to the development site.*

##### (c) Flame zone

*The distance from a bush fire at which there is significant potential for sustained flame contact to a building. Flame length will vary (short/long) depending on wind and slope. Minimum defendable area and APZ requirements reflect flame length/zone calculations.*

##### (d) Determining appropriate hazard parameters

*A robust hazard assessment for habitable building development must quantify, for different vegetation types, the parameters of fire attack (embers, radiant heat, flame contact and wind) that damage or destroy buildings. This system must relate these parameters to threshold values of vulnerable components of buildings (CSIRO, 2000).*



Determining appropriate hazard parameters requires measurements or models to describe:

- components of structures, the threshold values for radiant heat flux and their duration;
- the flame characteristics of temperature, emissivity and hence radiant heat flux at the flame;
- different vegetation types, the flame height and width of flame-front and flame duration for high intensity bush fires as they reach the edge of vegetation; and
- the value for radiant heat flux as a function of distance from walls of flame of different dimensions. (see CSIRO, 2000)

In 2004, the RFS developed a model which related hazard parameters to various building components. This model has been used as a basis for developing the following methodology. Table A3.2 can and should be used for determining the likely level of bush fire attack on a building and hence which level of construction from AS 3959 is appropriate in the particular circumstances.

The methodology is based on radiant heat flux derived for 12 vegetation formations (10 sub-formations), six slope classes and appropriate regional weather conditions and applied to different construction standards.

At radiant heat flux levels under  $12.5 \text{ kW/m}^2$ , unscreened windows may crack and allow heat and embers to enter the building leading to a building fire. At  $19 \text{ kW/m}^2$  screened windows could fail. At levels of  $29 \text{ kW/m}^2$  fascia board and flame retardant timbers are likely to ignite after a short period of exposure. Toughened glass is generally suitable up to levels of approximately  $25 \text{ kW/m}^2$  and requires screening at levels above this. For building elements

subject to radiant heat levels of greater than  $29 \text{ kW/m}^2$ , the use of exposed timber is not suitable without specific testing in accordance with suitable protocols.

The distances below can be considered on the basis of the various elements of a building when subject to heat, flames and ember attack. Extensive ember attack can occur beyond 100 metres ahead of a bush fire, however, distances are limited to a maximum of 100 metres for class 1, 2, 3 and Class 4 parts of buildings and Class 9 buildings that are SFPP.

Figure A3.1 and Table A3.1 summarise the relationship between radiant heat levels and required separation (APZ) distance

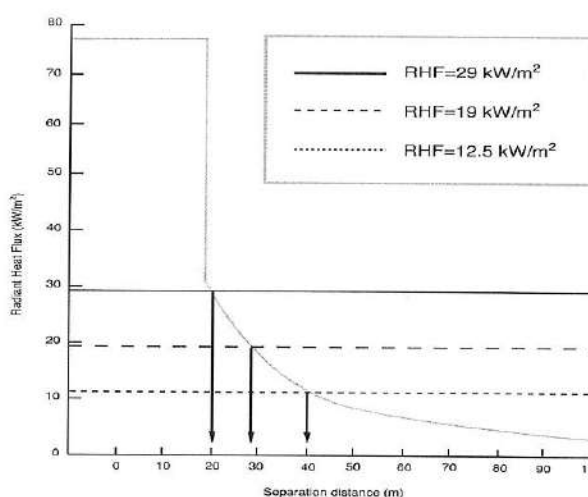


Figure A3.1 Sample radiation - distance graph of forests for FDI = 100 (0° slope)

Radiant Heat Flux	Likely Effects	Approx. distances
>29 – 110 $\text{kW/m}^2$ 29 $\text{kW/m}^2$	Flame Zone Ignition of most timbers without piloted ignition (3 minutes exposure) (Level 3 construction) during the passage of a bush fire. Toughened glass could fail.	0 - 20 metres
19 $\text{kW/m}^2$	Screened float glass could fail (Level 2 construction) during the passage of a bush fire.	20 metres
12.5 $\text{kW/m}^2$	Standard float glass could fail (Level 1 construction) during the passage of a bush fire. Some timbers can ignite with prolonged exposure and with piloted ignition source (eg embers)..	27 metres
10 $\text{kW/m}^2$	Critical conditions. Firefighters not expected to operate in these conditions although they may be encountered. Considered to be life threatening < 1 minute in protective equipment. Fabrics inside a building could ignite spontaneously with long exposures.	40 metres
7 $\text{kW/m}^2$	Likely fatal to unprotected person after exposure for several minutes	45 metres
4.7 $\text{kW/m}^2$	Extreme conditions. Firefighter in protective clothing will feel pain. (60 seconds exposure)	55 metres
3 $\text{kW/m}^2$	Hazardous conditions. Firefighters expected to operate for a short period (10 minutes)	70 metres
2.1 $\text{kW/m}^2$	Unprotected person will suffer pain after 1 minute exposure – non fatal.	100 metres
		140 metres

Note: assumes flame temperature of 1090K for all scenarios.

Table A3.1 Radiant heat flux and effects on buildings and people for a modeled forest fire (FDI 100 on flat ground)

Five categories of bush fire attack and three construction standards are determined and described in Table A3.2 below.

Level 1 construction standards shall apply if the proposed building is located within the specified distances within Tables A.3.3, A3.4 and A3.5 for **Medium Bush Fire Attack** (in AS 3959).

Level 2 construction standards shall apply if the proposed building is located within the specified distances within Tables A.3.3, A3.4 and A3.5 for **High Bush Fire Attack** (in AS 3959).

Level 3 construction standards shall apply if the proposed building is located within the specified distances within Tables A.3.3, A3.4 and A3.5 for **Extreme Bush Fire Attack** (in AS 3959).

Performance based assessments will need to apply if the building exceeds the specification of Level 3 of AS 3959 (ie  $>29 \text{ kW/m}^2$ ) in which case it is considered to be within the 'Flame Zone'.

In general, a deemed-to-satisfy outcome can be achieved where the building is exposed to a radiant heat of less than  $29 \text{ kW/m}^2$  without flame contact. There is no deemed-to-satisfy for

construction in the **Flame Zone**. Applicants need to consider the Performance Requirements of the BCA and the Specific Objectives of PBP for the type of building constructed as well as A3.5 below.

*Construction should not proceed where the proposed building has been identified as being at unacceptable risk because of any of the following:*

- *flame impingement will result in insufficient defensible space to protect the structure. These areas are identified as being within the Flame Zone;*
- *there is no safe escape route for the building occupants and firefighters likely to be involved in protecting the building and its occupants during a bush fire.*

The level of construction cannot fall to less than Level 1 construction where any part of the building is closer than 100 metres to the source of bush fire attack (unless otherwise provided for).

An elevation is exposed if there is a direct line of sight from any part of that elevation to the source of the bush fire attack (excluding fencing and other minor obstructions).

PBP Category	Description	AS 3959 Construction Level
Low	Minimal attack from radiant heat and flame due to the distance of the site from the vegetation, although some attack by burning debris is possible. There is insufficient threat to warrant specific construction requirements.	Low - no construction requirements
Medium	Attack by burning debris is significant with radiant heat (not greater than $12.5 \text{ kW/m}^2$ ). Radiant heat is unlikely to threaten building elements (eg unscreened glass). Specific construction requirements for ember protection and accumulation of debris are warranted.	Medium - Level 1
High	Attack by burning debris is significant with radiant heat levels (not greater than $19 \text{ kW/m}^2$ ) threatening some building elements (screened glass). Specific construction requirements for embers and radiant heat are warranted.	High - Level 2
Extreme	Attack by burning debris is significant and radiant heat levels (not greater than $29 \text{ kW/m}^2$ ) threaten building integrity. Specific construction requirements for ember and higher radiant heat are warranted. Some flame contact is possible.	Extreme - Level 3
Flame Zone	Radiant heat levels and flame contact likely to significantly threaten building integrity and result in significant risk to residents who are unlikely to be adequately protected.	Outside Scope

*Note: Attack from burning debris increases as the category of bush fire attack becomes more severe.*

Table A3.2 Categories of bush fire attack and appropriate construction levels

The key to determining required level of construction is the category of bush fire attack. The following subsection describes how to determine these categories.

## A3.4 Site assessment methodology for determining level of bush fire attack

*This general method has been used to determine the categories of bush fire attack using NSW data. This provides a more refined bush fire attack site assessment.*

*The methodology was developed (see Douglas and Tan, 2005) from the following inputs:*

- the relevant weather scenario for the fire weather district in NSW (see inside rear cover and Table A2.3)
- vegetation types and the corresponding fuel types present were determined (see Table A2.1)
- the appropriate fuel loads for the fuel types were used for input into fire behaviour models
- the fire-line intensity (kW/m) for a range of slope and distance combinations was calculated
- the sustained flame length was calculated and appropriate flame temperature applied (1090K)
- distance classes for radiant heat flux for 12.5 kW/m<sup>2</sup>, 19 kW/m<sup>2</sup> and 29 kW/m<sup>2</sup> were determined using the View Factor model
- based on the calculated fire behaviour, the level of bush fire attack (Levels 1, 2, and 3) corresponding to the relevant radiant heat flux on the proposed building was then determined. If the distance was less than the theoretical flame length then the application of AS 3959 construction levels are exceeded (i.e. Flame Zone). At distances greater than 100 metres no specific construction provisions are required for forests, woodlands and tall heaths. For arid shrublands, semi arid woodlands, rainforests and low heaths construction requirements may not be required at distances greater than 50 metres and in the case of rainforest 70 metres.

*This procedure is based upon the generic method described above and uses the weather scenario of an appropriate Forest Fire Danger Index (FDI) (for forest fuels), wind speeds of 45kph and typical fuel loads for NSW vegetation experienced during a severe bush fire in NSW.*

To determine the required level of construction for a building the following steps must be followed:

**Step 1: Determine vegetation formation types and sub-formations around the building (see Appendix 2), as follows:**

- (i) Identify all the vegetation types within 140 metres of the site using Keith (2004); and
- (ii) Classify the vegetation formations as set out in Table A2.1 in Appendix 2.

*Note: Forests within Tables A3.3, A3.4 and A3.5 include wet sclerophyll, dry sclerophyll and pine plantation forests. Forest fuel loads are based on dry sclerophyll forest formations except for alpine forest.*

**Step 2: Determine the distance** between each vegetation formation identified (from the edge of the foliage cover) and the building.

**Step 3: Determine the effective slope** of the ground for each vegetation group (see Appendix 2) using the classes provided below. Slopes are classified as follows:

- (i) Upslopes are considered to be 0°.
- (ii) From 0° but not greater than 5°.
- (iii) Greater than 5° but not greater than 10°.
- (iv) Greater than 10° but not greater than 15°.
- (v) Greater than 15° but not greater than 18°.

**Step 4: Determine the relevant FDI** for the council area in which the development is to take place from Table A2.3 in Appendix 2. For Alpine Resorts see Step 5 below.

**Step 5: Match the relevant FDI, appropriate vegetation, distance and effective slope classes** to determine the category of bush fire attack applicable to the site.

- FDI 100 – Table A3.3 (page 63)
  - FDI 80 – Table A3.4 (page 64)
  - FDI 50 – Table A3.5 (page 65)
- apply the relevant attack category to each facade.

Note: A building with any facade identified as requiring a construction level must build all facades to at least Level 1, corresponding to Medium attack.

**Step 6: Determine the appropriate level of construction** found in Section 3 of AS3959 as identified within Table A3.3 to A3.5 below for each facade of the building. For the categories of bush fire attack determined for the site of the building there are five corresponding bush fire attack levels and three levels of bush fire construction with deemed-to-satisfy arrangements:

- (i) No specific construction requirements for the category of low bush fire attack;
- (ii) Level 1 construction for the category of medium bush fire attack;
- (iii) Level 2 construction for the category of high bush fire attack;
- (iv) Level 3 construction for the category of extreme bush fire attack;
- (v) Specific performance levels are unachievable for the category of Flame Zone.

Where more than one facade is exposed to a hazard, then the facade with the highest construction requirement is used to determine the appropriate level of construction. All other facades may be reduced by one level of construction unless that facade is also subject to the same category of bush fire attack.

**Table A3.3 DETERMINATION OF CATEGORY OF BUSH FIRE ATTACK FDI 100**  
 (Greater Sydney, Greater Hunter, Illawarra/Shoalhaven, Southern Ranges, South Coast Fire (Weather) Areas) [see table A 2.3].

Vegetation Formation (class)	Categories of Bush Fire Attack (AS 3959-1999)				
	Flame Zone	Level 3 (Extreme)	Level 2 (High)	Level 1 (Medium)	No requirement
	Distance (m) of the site from the predominant vegetation class				

All upslopes and flat land (0 degrees)

Forests (wet and dry sclerophyll)	<20	20<29	29<40	40 - 100	>100
Woodlands	<11	11<16	16<23	23 - 100	>100
Tall heath	<13	13<19	19<27	27 - 100	>100
Short heath	<9	9<13	13<19	19 - 50	>50
Forested wetlands	<16	16<23	23<32	32 - 50	>100
Freshwater wetlands	<9	9<13	13<19	19 - 50	>50
Rainforest	<9	9<13	13<19	19 - 50	>50

Downslope > 0 to 5 degrees

Forests (wet and dry sclerophyll)	<25	25<36	36<49	49 - 100	>100
Woodlands	<14	14<20	20<29	29 - 100	>100
Tall heath	<15	15<22	22<31	31 - 100	>100
Short heath	<10	10<15	15<22	22 - 50	>50
Forested wetlands	<20	20<29	29<40	40 - 100	>100
Freshwater wetlands	<10	10<15	15<22	22 - 50	>50
Rainforest	<10	10<16	16<24	24 - 50	>50

Downslope > 5 to 10 degrees

Forests (wet and dry sclerophyll)	<34	34<45	45<59	59 - 100	>100
Woodlands	<18	18<26	26<37	37 - 100	>100
Tall heath	<17	17<24	24<35	35 - 100	>100
Short heath	<10	10<17	17<25	25 - 50	>50
Forested wetlands	<25	25<36	36<49	49 - 100	>100
Freshwater wetlands	<10	10<17	17<25	25 - 50	>50
Rainforest	<14	14<21	21<31	31 - 50	>50

Downslope > 10 to 15 degrees

Forests (wet and dry sclerophyll)	<47	47<55	55<71	71 - 100	>100
Woodlands	<24	24<33	33<46	46 - 100	>100
Tall heath	<19	19<28	28<39	39 - 100	>100
Short heath	<13	13<19	19<28	28 - 50	>50
Forested wetlands	<35	35<45	45<60	60 - 100	>100
Freshwater wetlands	<13	13<19	19<28	28 - 50	>50
Rainforest	<19	19<28	28<39	39 - 60	>60

Downslope > 15 to 18 degrees

Forests (wet and dry sclerophyll)	<57	57<62	62<80	80 - 100	>100
Woodlands	<29	29<38	38<52	52 - 100	>100
Tall heath	<20	20<30	30<41	41 - 100	>100
Short heath	<14	14<21	21<30	30 - 50	>50
Forested wetlands	<43	43<51	51<67	67 - 100	>100
Freshwater wetlands	<14	14<21	21<30	30 - 50	>50
Rainforest	<23	23<32	32<44	44 - 70	>70

Note: "Forests" refers to wet sclerophyll forest, dry sclerophyll forest and plantation forest (including pine plantations).



# Appendices

Table A 3.4 DETERMINATION OF CATEGORY OF BUSH FIRE ATTACK FDI 80

Vegetation Formation (class)	Categories of Bush Fire Attack (AS 3959-1999)				
	Flame Zone	Level 3 (Extreme)	Level 2 (High)	Level 1 (Medium)	No requirement
	Distance (m) of the site from the predominant vegetation class				
All upslopes and flat land (0 degrees)					
Forests (wet and dry sclerophyll)	<17	17<25	25<35	35 - 100	>100
Woodlands	<9	9<14	14<20	20 - 100	>100
Tall heath	<13	13<19	19<27	27 - 100	>100
Short heath	<9	9<13	13<19	19 - 50	>50
Low woodland (semi-arid)	<7	7<10	10<15	15 - 50	>50
Arid shrublands	<8	8<12	12<18	18 - 50	>50
Forested wetlands	<13	13<19	19<28	28 - 50	>100
Freshwater wetlands	<9	9<13	13<19	19 - 50	>50
Rainforest	<7	7<11	11<16	16 - 50	>50
Downslope > 0 to 5 degrees					
Forests (wet and dry sclerophyll)	<22	22<31	31<42	42 - 100	>100
Woodlands	<12	12<17	17<25	25 - 100	>100
Tall heath	<15	15<22	22<31	31 - 100	>100
Short heath	<10	10<15	15<22	22 - 50	>50
Low woodland (semi-arid)	<8	8<11	11<17	17 - 50	>50
Arid shrublands	<9	9<14	14<21	21 - 50	>50
Forested wetlands	<17	17<24	24<34	34 - 100	>100
Freshwater wetlands	<10	10<15	15<22	22 - 50	>50
Rainforest	<9	9<14	14<20	20 - 50	>50
Downslope > 5 to 10 degrees					
Forests (wet and dry sclerophyll)	<28	28<38	38<52	52 - 100	>100
Woodlands	<15	15<22	22<32	32 - 100	>100
Tall heath	<17	17<24	24<35	35 - 100	>100
Short heath	<10	10<17	17<25	25 - 50	>50
Low woodland (semi-arid)	<9	9<14	14<20	20 - 50	>50
Arid shrublands	<10	10<16	16<24	24 - 50	>50
Forested wetlands	<20	20<31	31<42	42 - 100	>100
Freshwater wetlands	<10	10<17	17<25	25 - 50	>50
Rainforest	<12	12<18	18<26	26 - 50	>50
Downslope > 10 to 15 degrees					
Forests (wet and dry sclerophyll)	<38	38<47	47<63	63 - 100	>100
Woodlands	<19	19<28	28<40	40 - 100	>100
Tall heath	<19	19<28	28<39	39 - 100	>100
Short heath	<13	13<19	19<28	28 - 50	>50
Low woodland (semi-arid)	<10	10<17	17<25	25 - 50	>50
Arid shrublands	<12	12<18	18<27	27 - 50	>50
Forested wetlands	<29	29<39	39<52	52 - 100	>100
Freshwater wetlands	<13	13<19	19<28	28 - 50	>50
Rainforest	<15	15<23	23<33	33 - 50	>50
Downslope > 15 to 18 degrees					
Forests (wet and dry sclerophyll)	<45	45<54	54<70	70 - 100	>100
Woodlands	<23	23<33	33<45	45 - 100	>100
Tall heath	<20	20<30	30<41	41 - 100	>100
Short heath	<14	14<21	21<30	30 - 50	>50
Low woodland (semi-arid)	<13	13<20	20<29	29 - 100	>100
Arid shrublands	<13	13<20	20<29	29 - 50	>50
Forested wetlands	<35	35<44	44<59	59 - 100	>100
Freshwater wetlands	<14	14<21	21<30	30 - 50	>50
Rainforest	<19	19<27	27<38	38 - 50	>50

Note: "Forests" refers to wet sclerophyll forest, dry sclerophyll forest and plantation forest (including pine plantations). This table applies to the Fire Areas not covered in Table A 3.3 or Table A 3.5.

Table A 3.5 DETERMINATION OF CATEGORY OF BUSH FIRE ATTACK FDI 50 (Alpine Resorts)

Vegetation Formation (class)	Categories of Bush Fire Attack (AS 3959-1999)				
	Flame Zone	Level 3 (Extreme)	Level 2 (High)	Level 1 (Medium)	No requirement
	Distance (m) of the site from the predominant vegetation class				
All upslopes and flat land (0 degrees)					
Forests	<15	15<22	22<31	31 - 100	>100
Woodlands	<7	7<10	10<15	15 - 100	>100
Tall heath	<13	13<19	19<27	27 - 100	>100
Short heath	<9	9<13	13<19	19 - 50	>50
Alpine Complex	<9	9<14	14<20	20 - 50	>50
Downslope > 0 to 5 degrees					
Forests	<18	18<27	27<37	37 - 100	>100
Woodlands	<8	8<12	12<18	18 - 100	>100
Tall heath	<15	15<22	22<31	31 - 100	>100
Short heath	<10	10<15	15<22	22 - 50	>50
Alpine Complex	<10	10<16	16<23	23 - 50	>50
Downslope > 5 to 10 degrees					
Forests	<23	23<33	33<45	45 - 100	>100
Woodlands	<10	10<15	15<23	23 - 100	>100
Tall heath	<17	17<24	24<35	35 - 100	>100
Short heath	<10	10<17	17<25	25 - 50	>50
Alpine Complex	<12	12<18	18<26	26 - 50	>50
Downslope > 10 to 15 degrees					
Forests	<31	31<41	41<55	55 - 100	>100
Woodlands	<13	13<20	20<29	29 - 100	>100
Tall heath	<19	19<28	28<39	39 - 100	>100
Short heath	<13	13<19	19<28	28 - 50	>50
Alpine Complex	<13	13<20	20<29	29 - 50	>50
Downslope > 15 to 18 degrees					
Forests	<37	37<46	46<61	61 - 100	>100
Woodlands	<15	15<23	23<33	33 - 100	>100
Tall heath	<20	20<30	30<41	41 - 100	>100
Short heath	<14	14<21	21<30	30 - 50	>50
Alpine Complex	<15	15<22	22<31	31 - 50	>50

Note: This table covers the NSW Alpine resort areas of:

- The Perisher Range – Perisher, Smiggin Holes, Blue Cow and Guthega.
- Thredbo Alpine Village
- Charlottes Pass
- Mount Selwyn
- Ski Rider
- Kosciuszko Mountain Retreat
- Sponars Chalet
- Bullocks Flat

Forests are based on forest types found.

## A3.5 Construction Considerations within the Flame Zone

Buildings constructed within the flame zone are likely to be exposed to direct flame impingement from the fire front. The severity of this exposure is dependent upon the severity of the fire and separation of vegetation from the building, gradient and wind direction. The period of exposure to direct flame impingement from the fire front is dependent on distance from the bushland and can range from less than 3 minutes to sustained flame contact from heavy fuels of up to 20 minutes or more.

There is potential for the flame impingement to ignite the external façade of a building which can continue to burn after the passage of the fire front. Therefore some degree of conservatism in relation to the exposure period is appropriate. It is for this reason that the provisions of AS 3959 alone are not adopted within the category of attack Flame Zone in NSW.

There are no deemed-to-satisfy arrangements for construction of buildings within the Flame Zone. Where flame contact is likely, the radiant heat and convective heat exposures are considerable and overwhelms most materials.

While AS 3959 can be used as a guide to improve building safety, this is subject to additional control measures not included in this document. The design and construction of a building is just one means of mitigating the bush fire risk and will normally require supplementation by a range of other mitigation measures to the satisfaction of the council. Installation of hose reels, sprinkler systems and additional water supplies may be needed.

The extent of additional measures required will be dependent upon the bush fire hazard and its proximity. In addition to the construction requirement of AS 3959, applicants should also address the Performance Requirements of the BCA and consider the siting and the design principles in Section 4.3.5.

Where new testing regimes are developed, these should be incorporated as part of the process of developing alternative solutions for flame zone conditions (and other levels of bush fire attack). These alternative solutions will be considered on their merits and could form important developments in the area of bush fire safety for buildings.



## Appendix 4

# Submission Requirements for DAs on bush fire prone land

### A4.1 For general development applications to be considered under section 79BA of the EP&A Act

Development applications on bush fire prone land must be accompanied by a Bush Fire Assessment Report within the Statement of Environmental Effects demonstrating compliance with the aim and objectives of PBP and the specific objectives and performance criteria for the land use proposed. In particular, the following matters must be addressed.

- i. a statement that the site is bush fire prone land, where applicable,
- ii. the location, extent and vegetation formation of any bushland on or within 100 metres of the site,
- iii. the slope and aspect of the site and of any bush fire prone land within 100 metres of the site, which may determine the likely path of any bush fires,
- iv. any features on or adjoining the site that may mitigate the impact of a high intensity bush fire on the proposed development, and
- v. a statement assessing the likely environmental impact of any proposed bush fire protection measures.
- vi. whether any building is capable of complying with AS 3959/1999 in relation to the construction level for bush fire protection.

For most smaller applications this can be done relatively simply and can be accompanied by a diagram showing the required features with approximate distances. The RFS has also produced guidelines for lodging of information for single dwellings. These can be downloaded from the RFS website at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

### A4.2 For integrated development applications under section 100B of the RF Act and section 91 of the EP&A Act

The detailed information to be contained within a Bush Fire Assessment Report submitted to the RFS under Clause 46 of the RF Reg is:

- a description of the property
  - provide Lot No., DP of subject land
  - street address with locality map
- zoning of subject land and any adjoining lands
- staging issues, if relevant, and description of the whole proposal;
- aerial or ground photographs of subject land including contours and existing and proposed cadastre .
- the classification of vegetation out to 140 metres from the development
  - provide a structural description consistent with the identification key in Keith D (2004) and PBP.
  - identify any past disturbance factors and any future intended land uses that could alter the vegetation classification in the future.
- an assessment of the effective slope to a distance of 100 metres
  - usually 5m contours will suffice for subdivisions, 10 metres should be used only if there has not been a survey undertaken by a registered land surveyor.
  - the effective slope is the slope under the vegetation assessed as being a hazard in relation to the development and not the slope within the asset protection zone.
- identification of any significant environmental features - these could include the presence of:
  - riparian corridors
  - SEPP 14 – Coastal Wetlands
  - SEPP 26 Littoral rainforests
  - SEPP 44 – Koala Habitat
  - areas of geological interest
  - environmental protection zones or steep lands (>18°)
  - land slip or flood prone areas
  - national parks estate or various other reserves.
- details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant
  - details of some threatened species can be found on the web ([www.environment.nsw.gov.au](http://www.environment.nsw.gov.au))
  - past studies or surveys for the area (eg local environment studies)
  - documentation supplied to council in relation to flora and fauna
- details of Aboriginal heritage known to the applicant
  - past surveys and information held by the DEC. (application fees may apply)



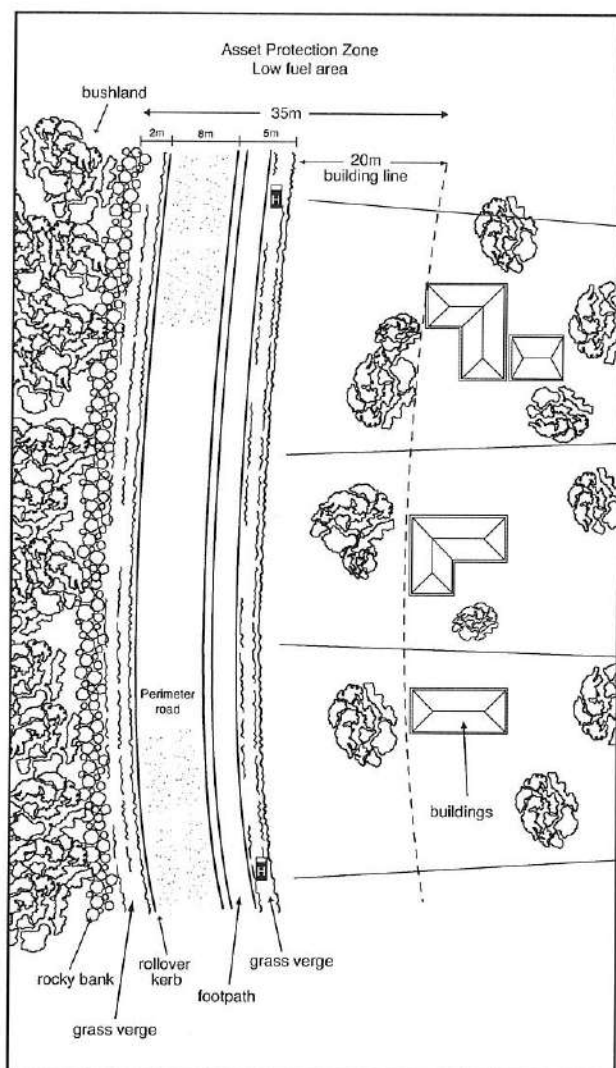


Figure A 4.1 Example of information supplied on a plan with a bush fire threat assessment.

*The RFS has also produced guidelines for lodging of information for simple subdivision (e.g. one lot into two lots). These can be downloaded from the RFS website at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).*

- a bush fire assessment that addresses –
  - asset protection zones (including any management arrangements, any easements including those contained on adjoining lands)
  - siting and adequacy of water (in relation to reticulation rates or where dedicated water storage will be required)
  - capacity of public roads (especially perimeter roads and traffic management treatments)
  - whether public roads link to fire trails and have two way access
  - adequacy of access and egress
  - adequacy of maintenance plans (eg landscaping) and emergency procedures (especially SFPP developments)
  - construction standards to be used (where non-conformity to the deemed-to-satisfy arrangement is envisaged, which aspects are not intended to conform)
  - adequacy of sprinkler systems (only as an adjunct to other passive controls).
- an assessment of how the development complies with the acceptable solutions, performance requirements and relevant specific objectives within Chapter 4 of PBP.

APZs should be identified on plans for interface allotments by either a building line or building footprint. In some cases building envelopes are identified which include other building constraints. Unless otherwise specified, a building envelope will be taken as the building footprint. Where an applicant proposes not to follow the acceptable solutions for particular bush fire protection measures, detailed evidence must be provided demonstrating compliance with performance criteria and intent of the measures proposed. For alternate solutions under the BCA, the applicant must demonstrate how the product, design or material can meet the performance requirements of the BCA (see clause AO.8 in Volume 1 of the BCA).

*In relation to significant environmental features, threatened species, endangered populations, endangered ecological communities and Aboriginal heritage issues, the RFS only requires sufficient information to ascertain that the environmental values are or are not a constraint to development. The RFS is not providing an approval in relation to the loss or removal of these environmental assets. That is the role of the relevant consent authority.*

## Appendix 5

# Bush Fire Provisions - Landscaping and Property Maintenance

### A5.1 Introduction

Bush fires are a natural and periodic event in the Australian landscape. Many Australian plants and animals have adapted to fire over thousands of years and require fire as part of their life cycle.

However, development adjacent to bushland areas has increased the risk of fire impacting on people and their assets. Fire management needs to strike a balance between the protection of life and property and the maintenance of ecological processes and systems.

In Australia, bush fires are inevitable and an essential aspect of the landscape.

However, the impact on property and life can be reduced with responsible preparation and management of bush fire hazards. This is the responsibility of all land managers, as well as communities and individuals taking responsibility for their own fire safety.

The level of protection for life or whether or not a house or other assets survive a bush fire ultimately depends on the landowner and their level of preparedness against bush fire attack.

The planning system can be used to better effect in protecting human life, property and environmental values from the impacts of bush fire events.

In some cases this will involve land use planning and development controls, construction standards, APZs and subdivision layout, siting, design and provision of services. It also involves careful and deliberate consideration of the environmental impacts of these and how we can recognise the need to protect our wetlands, rainforests, koala habitat and other biodiversity and cultural values.

However, the best planning can be undone by poor maintenance and lack of forethought when landscaping a development. Therefore house survival ultimately depends on the householder.

Some maintenance also depends upon adjoining neighbours and upon fuel management in adjacent bush land areas by the owners, occupiers or managers of that land. General housekeeping and maintenance of the grounds by the householder is equally important and, in some cases, may even be more so.

Experience from the Canberra 2003 fires suggests that house losses are greatest in the area up to 250 metres from the bush interface. Distances of

less than 100 metres are particularly vulnerable to flame contact, radiant heat and ember attack.

Hence it is within this distance that efforts should be made to prepare for the onslaught of major bush fire events.

While other legislation provides the impetus for planning objectives, the RF Act provides the legislative vehicle to achieve bush fire management objectives.

In this appendix consideration will be given to the principles for landscaping and management, and the role of property maintenance during the fire event.

### A5.2 Principles of Protection

Bush fire attack takes essentially five forms;

- wind,
- smoke,
- ember,
- radiant heat and
- flame.

Evidence indicates ember attack is responsible for most bush fire related house fires. Strong winds resulting from severe bush fires will drive embers into vulnerable areas of a building, preheat and dry fuel ahead of a fire, lift roofing and extend flames along a more horizontal plane closer to building elements. Embers can also cause spotting in advance of the bush fire and provide piloted ignition to building elements. To effectively protect a building, strategies must be implemented that separate it from the hazard and reduce the intensity of bush fires to minimise the combined impact of ember, wind, flame and heat attack.

While smoke will cause minimal damage to property, it can severely affect the health of residents. Smoke is a significant factor in areas in which aged or disabled persons reside – hospitals and nursing homes – and more so where residents are susceptible to respiratory disorders.

Radiant heat (measured in kW/m<sup>2</sup>) can severely impair firefighting operations, the health of residents and the integrity of building elements. Radiant heat in excess of 10kW/m<sup>2</sup> can prevent emergency services personnel assisting residents of SFPP developments.

Flame attack will severely restrict firefighting operations, provide piloted ignition to building elements and threaten the health of residents and their capacity to evacuate the area.

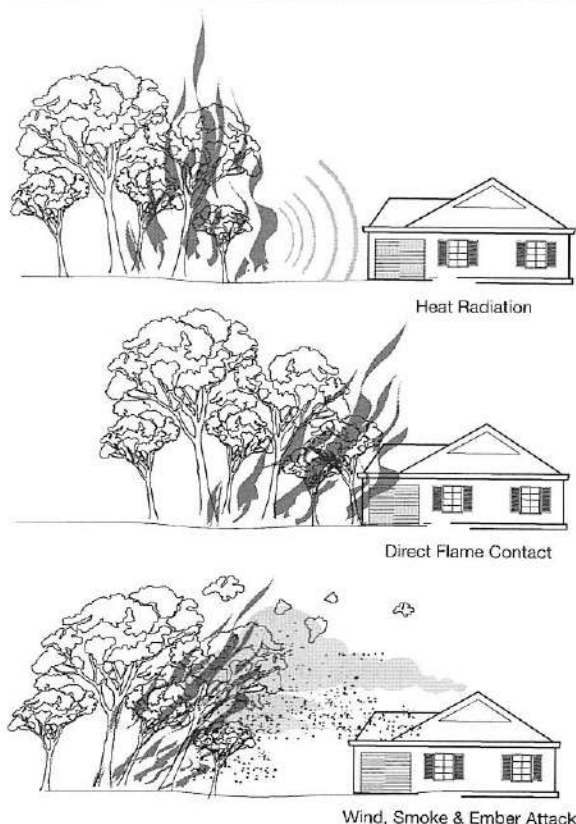


Figure A 5.1 Bush Fire Attack Mechanisms

Overall the intention of bush fire protection measures should be to prevent flame contact to a structure, reduce radiant heat to below the ignition thresholds for various elements of a building, to minimise the potential for wind driven embers to cause ignition and reduce the effects of smoke on residents and firefighters.

## A5.3 Principles of Landscaping Properties for Bush Fire Protection

The principles of landscaping for bush fire protection aim to:

- Prevent flame impingement on the dwelling;
- Provide a defendable space for property protection;
- Reduce fire spread;
- Deflect and filter embers;
- Provide shelter from radiant heat; and
- Reduce wind speed.

### (a) Vegetation choices

All vegetative material can burn under the influence of bush fire.

With this in mind, careful attention must be paid to species selection, their location relative to their flammability, avoidance of continuity of vegetation (horizontally and vertically), and ongoing maintenance to readily remove flammable fuels (leaf litter, twigs and debris).

In the paper *"Landscape and Building Design for Bushfire Areas"* G.C. Ramsay and L. Rudolph have provided 14 attributes of vegetation which affect bush fire attack. In summary these attributes are:

- Moisture content of leaves;
- Volatile oil content of leaves;
- Mineral content of leaves;
- Leaf fineness;
- Density of foliage;
- Continuity of plant form;
- Height of lowest foliage above ground;
- Size of plant;
- Dead foliage on the plant;
- Bark texture;
- Quantity of ground fuels;
- Fineness of ground fuels;
- Compaction ability of ground fuels; and
- Mineral content of ground fuel.

What is clear is that the higher moisture content of leaves (mesic), the less bark that will be available and the lower the leaf drop, all of which will assist with maintenance of the understorey and will also assist in reducing bush fire attack.

Work in the USA and elsewhere has also suggested that in addition to removal of understorey species, the trimming of lower limbs of trees also assists in reducing fire penetration into the canopy. Trees such as 'pencil pines' and African olive have been attributed with high fire propagation due to the high fine fuel and/or oil content captured within the canopy. This leads to significant flame height. Avoid such species in favour of rainforest species such as Figs and Syzygium.

When choosing plants, be sure not to introduce weed species into an area. Fire events may provide the opportunity for weed species to spread and may contribute fuel to an area of otherwise lower fuel loads.

Contact local councils, plant nurseries and plant societies to determine suitable species for your area.

### (b) Trees as Windbreaks

The use of trees as windbreaks is a common practice but trees also provide a useful function, trapping embers and flying debris, which would otherwise reach the house. The tree crown will rarely carry fire unless there is a significant fuel loading on the ground.

By reducing the wind speed, a row of trees also slows the rate of spread of a bush fire and a dense foliage traps radiant heat, lowering bush fire radiant heat.

Because of the effect of turbulence, a balance has to be struck between a high density of trees (that

maximises the trapping of embers and radiant heat but also maximises turbulence) and a lower density (that allows more embers and radiant heat to pass through but minimises turbulence). A windbreak that allows 30–60% of the wind to pass through is ideal as less than this becomes too solid with ember laden winds being carried over the top of the break.

To be effective a windbreak must:

- be located on the side of the lot from which fire weather normally approaches;
- be of sufficient length (generally 100 metres minimum length);
- be located at a distance of one to three times the height of fully grown trees but not within the IPA;
- use smooth barked eucalypts, rainforest trees or deciduous trees;
- make sure there are no breaks of sufficient size to allow winds to funnel through; and
- be separated by sufficient distance from the hazard so as not to be consumed and become a hazard itself.

#### A5.4 Vegetation Management

Where APZs have been incorporated as part of the development approval for subdivision or for dwelling construction, the environmental aspects of the development should have already been taken into account.

In general, it is expected that APZs will be maintained by the owner of the land including maintenance of any fire trail constructed as part of the development.

It is accepted practice that after construction of a dwelling, gardens will be established and landscaping of the grounds will be undertaken. It is essential that efforts to reduce fuels on adjoining properties are therefore not negated by actions within the immediate curtilage of the building.

In terms of priorities of addressing bush fire attack, priority should be given to preventing flame impingement by not allowing fine debris to accumulate close to the building. Secondly, removal of understorey fuels aids in the reduction of flame heights and likely canopy fire, thereby reducing overall radiant heat. Removal of loose bark and fine fuels reduces both heat output and ember generation, while the retention of taller trees with canopies will also assist in filtering out embers.

To maintain a garden that does not contribute to the spread of bush fires, it is necessary to plan the layout of the garden beds and take an active decision to minimise certain features in favour of other features. These should include:

- maintaining a clear area of low cut lawn or pavement adjacent to the house;
- keeping areas under fences, fence posts and

- gates and trees raked and cleared of fuel;
- utilising non-combustible fencing and retaining walls
- breaking up the canopy of trees and shrubs with defined garden beds;
- organic mulch should not be used in bush fire prone areas and non flammable material should be used as ground cover, eg Scoria, pebbles, recycled crushed bricks.
- planting trees and shrubs such that:
  - the branches will not overhang the roof;
  - the tree canopy is not continuous; and
  - there is a windbreak in the direction from which fires are likely to approach.

The RFS has developed its document "Standards for Asset Protection Zones" which should be consulted for APZ specifications. This is also available on the RFS web page at [www.rfs.nsw.gov.au](http://www.rfs.nsw.gov.au).

#### A5.5 Maintenance of Property

Sensible arrangements for landscaping and maintenance of the property are critical in the prevention of losses.

In considering property maintenance the following items should therefore be implemented in advance of the bush fire season:

- removal of material such as litter from the roof and gutters;
- ensure painted surfaces are in good condition with decaying timbers being given particular attention to prevent the lodging of embers within gaps;
- check pumps and water supplies are available and in working order;
- driveways are in good condition with trees not being too close and forming an obstacle during smoky conditions;
- check tiles and roof lines for broken tiles or dislodged roofing materials;
- screens on windows and doors are in good condition without breaks or holes in flyscreen material and frames are well fitting into sills and window frames;
- drenching or spray systems are regularly tested before the commencement of the fire season;
- hoses and hose reels are not perished and fittings are tight and in good order;
- doors are fitted with draught seals and well maintained;
- mats are of non combustible material or in areas of low potential exposure; and
- woodpiles, garden sheds and other combustible materials are located downslope and well away from the house.

Trees and other vegetation in the vicinity of power lines and tower lines should be managed and trimmed in accordance with the specifications in "Vegetation Safety Clearances" issued by Energy Australia (NS179, April 2002).



## AS 3959

Australian Standard AS 3959 Construction of buildings in bushfire-prone areas, Standards Australia, 1999, that outlines construction standards applicable to residential developments in bush fire prone areas.

## Asset Protection Zone (APZ)

Often referred to as a fire protection zone. Aims to protect human life, property and highly valued public assets and values. An area surrounding a development managed to reduce the bush fire hazard to an acceptable level. The width of the APZ will vary with slope, vegetation and construction level. The APZ, consisting of an area maintained to minimal fuel loads and, for subdivision, comprising a combination of perimeter road, fire trail, rear yard or a reserve, so that a fire path is not created between the hazard and the building.

## Bush fire protection measures (BPM)

The suite of measures available for minimizing the risk of bush fire attack and the threat to life and property.

## Building Code of Australia (BCA)

The Building Code of Australia means the document of that name published on behalf of the Australian Building Codes Board (ABCB) (as amended), together with:

- a) such amendments made by the Board, and
- b) such variations approved by the Board in relation to New South Wales, as are prescribed by the EP&A Regulations.

There are 10 classes of buildings as defined by the BCA (see Appendix 1).

## Building footprint

The area shown on a plan over which a building can be erected.

## Bush fire (also Bushfire)

A fire involving grass, scrub or forest.

## Bush fire attack

Arises from direct flame impingement, radiant heat or ember attack.

## Bush fire hazard

The potential severity of a fire. Usually measured in terms of intensity (kW/m), the factors that influence a bush fire hazard include climate and weather patterns, vegetation (fuel quantity, distribution and moisture) and slope.

## Bush fire hazard reduction works

- a) the establishment or maintenance of fire breaks on land, and

- b) the controlled application of appropriate fire regimes or other means for the reduction or modification of available fuels within a predetermined area to mitigate against the spread of a bush fire,

but does not include construction of a track, trail or road.

## Bush fire prone area/land

Is an area of land that can support a bush fire or is likely to be subject to bush fire attack. In general, a bush fire prone area is an area mapped for a local government area that identifies the vegetation types and associated buffer zones. Bush fire prone land maps are prepared by local councils and certified by the Commissioner of the RFS.

## Bush fire prone land map (BPL Map)

for an area means a map certified under section 146(2) of the EP&A Act.

## Bush fire protection measures (BPMs)

are a range of measures (controls) available to minimise the risk arising from a bush fire. BPMs include APZs, construction standards, suitable access arrangements, water and utility services, emergency management arrangements and landscaping.

## Bush fire risk

Is the chance of a bush fire igniting, spreading and causing damage to assets of value to the community. Risk may be rated as being extreme, major, moderate, minor or insignificant and is related to the vulnerability of the asset.

## Bush fire safety authority

An approval of the Commissioner of the NSW RFS required for a subdivision for residential or rural residential purpose or for a special fire protection purpose listed under section 100B(6) of the RF Act. This form of development is considered to be integrated development.

## Bush fire assessment report

A report submitted in support of a development application by an applicant which determines the extent of bush fire attack to a development and the measures used to mitigate that attack. Appendix 4 provides the information requirements for a bush fire assessment. See also clause 46 of the RF Regulation.

## Certifying Authority

As defined in the EP&A Act. Those with authority to issue Part 4A and Complying Development Certificates.

## Consent Authority

Is defined in the EP&A Act, in relation to Development Consents. Usually the local council.

**Defendable space**

Is an area within the asset protection zone that provides an environment in which a person can undertake property protection after the passage of a bush fire with some level of safety.

**Development**

Is defined in the EP&A Act.

**Development Application (DA)**

An application for consent to carry out development such as building, subdivision, or the use of a building or land. Applications are normally made to the local council.

**Ecologically Sustainable Development (ESD)**

As defined in section 6 of the *Protection of the Environment Administration Act (NSW) 1991*.

**Ecotourist developments**

aim to foster environmental and cultural understanding, appreciation and conservation and to be ecologically sustainable (being located in a relatively undisturbed natural area).

**Equivalent to an APZ**

is when the building will be separated from the bush fire hazard by other development (including roads, other buildings and managed properties) with a setback distance greater than or equal to the distance which would have been occupied by an APZ, if the development had been established having regard to the provisions of Appendix 3 of this document.

**Fire Intensity**

the rate of heat release, per unit length of fire front. The primary unit is kilowatts per metre of fire front (kW/m). It is a function of the heat content of the fuel (H), the weight of the fuel consumed (W), and the rate of spread of the fire (r).

**Fire protection systems.**

In this document the term is used to refer to the use of drencher/sprinkler systems used to dispense water on to the walls, roof, windows and other elements of a building.

**Flame zone**

The distance from a bush fire at which there is significant potential for sustained flame contact to a building. Determined by the calculated distance at which the radiant heat of the design fire exceeds 29kW/m<sup>2</sup> or calculated by the sustained flame length, whichever is the lesser.

**Infill development**

refers to the development of land by the erection of or addition to a residential building (or buildings) which does not require the spatial extension of services including public roads, electricity, water or sewerage and is within an existing allotment.

**Integrated development**

is development referred to under section 91 of the EP&A Act.

**Integrated housing**

development means a subdivision into two or more lots and the simultaneous design and construction of dwellings.

**Local Environmental Plan (LEP)**

Local Environmental Plan prepared under Part 3 of the EP&A Act. Plans prepared by a council that describe the planning status (zone) and/or development standards required for the future development of an area.

**Public road**

is an area that is open to or used by the public and is developed for, or has as one of its main uses, the driving or riding of motor vehicles.

**Setback**

The distance required through planning provisions to separate a building from the bush fire hazard, street frontage or from adjacent buildings.

**Should**

This is to be read as a prescriptive requirement but recognises that there are exceptional circumstances that warrant consideration of a bush fire protection measure based on performance and the merits of the case including provision for community safety.

**Special fire protection purposes**

are defined in Appendix 3.1.

**State Environmental Planning Policy (SEPP)**

is an environmental planning instrument prepared under Part 3 of the EP&A Act

**Subdivision**

of land means the division of land into two or more parts that, after the division, would be obviously adapted for separate occupation, use or disposition. The division may (but need not) be effected:

- (a) by conveyance, transfer or partition, or
- (b) by any agreement dealing, plan or instrument rendering different parts of the land available for separate occupation, use or disposition.

It includes strata subdivision, community title and boundary adjustments.

**Vegetation formations (and sub-formations)**

are different vegetation types and classes defined by Keith D. 2004 in: "Ocean Shores to Desert Dunes" published by DEC.

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- Wilson, A.A.G. and Ferguson I.S.** (1984) "Australian Forestry", pp230-236. "Fight or Flee? – A Case Study of the Mount Macedon bushfire".

**Certificate No.: PC/2018/1498**

**Certificate Date:** 15/05/2018

**Fee Paid:** \$53.00

**Receipt No.:** C2018/28897

**Your Reference:** MRT:SE:36876

**SECTION 10.7 PLANNING CERTIFICATE**

**Environmental Planning and Assessment Act, 1979 as amended**

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<b>APPLICANT:</b>	Tranter Lawyers  admin@tranterlawyers.com.au
<b>PROPERTY DESCRIPTION:</b>	16 Esk Circuit MAITLAND VALE NSW 2320
<b>PARCEL NUMBER:</b>	96482
<b>LEGAL DESCRIPTION:</b>	Lot 221 DP 1239804

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**IMPORTANT: Please read this Certificate carefully.**

This Certificate contains important information about the land described above.

Please check for any item, which could be inconsistent with the proposed use or development of the land. If there is anything you do not understand, please contact Council by phoning (02) 4934 9700, or personally at Council's Administration Building at 285-287 High Street, Maitland.

The information provided in this Certificate relates only to the land described above. If you require information about adjoining or nearby land, or about the Council's development policies or codes for the general area, contact Council's Planning & Environment Department.

All information provided is correct as at the date of issue of this Certificate, however it is possible for changes to occur at any time after the issue of this Certificate. We recommend that you only rely upon a very recent Certificate.

The following responses are based on the Council's records and/or information from sources outside the Council. The responses are provided with all due care and in good faith, however the Council cannot accept responsibility for any omission or inaccuracy arising from information outside the control of the Council.

Furthermore, while this Certificate indicates the general effect of the zoning of the abovementioned land, it is suggested that the applicable planning instruments be further investigated to determine any additional requirements.

**Copies of Maitland City Council's Local Environmental Planning Instrument, Development Control Plans and Policies are available from Council's [website](http://maitland.nsw.gov.au).**





## **PART 1: MATTERS PROVIDED PURSUANT TO SECTION 10.7 (2)**

### **1. Local Environmental Plan (LEP)**

Maitland LEP 2011, published 16 December 2011, applies to the land.

#### **Exhibited draft Local Environmental Plans**

No draft local Environmental Plans that have been on public exhibition under the Act are applicable to the land.

#### **Development Control Plan prepared by Council**

Maitland Development Control Plan 2011 applies to the land.

#### **Development Control Plan prepared by the Director General**

The Council has not been notified of any Development Control Plan applying to the land that has been prepared by the Director-General under section 51A of the Act.

#### **State Environmental Planning Policies**

The Minister for Planning has notified that the following State Environmental Planning Policies (SEPPs) shall be specified on Certificates under Section 10.7 of the Environmental Planning and Assessment Act, 1979.

The land is affected by the following State Environmental Planning Policies:

- SEPP21 Caravan Parks
- SEPP (Mining, Petroleum Production and Extractive Industries) 2007
- SEPP30 Intensive Agriculture
- SEPP33 Hazardous and Offensive Development
- SEPP36 Manufactured Home Estates
- SEPP44 Koala Habitat Protection
- SEPP50 Canal Estate Development
- SEPP (Housing for Seniors or People with a Disability) 2004
- SEPP (Major Development) 2005
- SEPP (State and Regional Development) 2011
- SEPP55 Remediation of Land
- SEPP Affordable Rental Housing 2009
- SEPP Building Sustainability Index: BASIX 2004
- SEPP (Exempt and Complying Development Codes) 2008
- SEPP (Infrastructure) 2007
- SEPP (Miscellaneous Consent Provisions) 2007
- SEPP64 Advertising and Signage
- SEPP65 Design Quality of Residential Apartment Development
- SEPP70 Affordable Housing (Revised Schemes)

- SEPP Vegetation in Non Rural Areas 2017
- SEPP (Educational Establishments and Child Care Facilities) 2017
- SEPP (Rural Lands) 2008

### **Draft State Environmental Planning Policies**

The following draft State Environmental Planning Policy(s) applying to the land is, or has been, the subject of community consultation or on public exhibition under the Act:

#### ***Draft State Environmental Planning Policy (Infrastructure) Amendment (Review) 2016***

The draft policy amends the existing SEPP by including new provisions for health services facilities, correctional centres, emergency and police services, public administration buildings, and council services on operational lands. The draft policy coincides with the development of the new State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017.

#### ***Review of State Environmental Planning Policy 44 - Koala Habitat Protection***

The proposed amendment to this SEPP will update the controls to better protect koala habitat. The update will bring the SEPP into line with the current planning system and support councils to prepare comprehensive plans of management. The amendments will also improve the application of the SEPP by recognising the extent of tree species important to koalas.

## **2. Zoning and land use under relevant LEPs**

Maitland LEP 2011, published 16 December 2011, identifies the zone applying to the land as:

### **R5 Large Lot Residential, RU1 Primary Production**

The following development information gives the objectives of the zone, the description of the zone and identifies development allowed or prohibited in each zone. Development consent where required, must be obtained from the Council.

### **R5 Large Lot Residential**

#### **a) Purpose/Objective**

- To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality
- To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future
- To ensure that development in the area does not unreasonably increase the demand for public services or public facilities
- To minimise conflict between land uses within this zone and land uses within adjoining zones

#### **b) Permitted with Consent**

Bed and breakfast accommodation; Building identification signs; Business identification signs; Dual occupancies; Dwelling houses; Home-based child care; Home industries; Neighbourhood shops; Roads; Any other development not

specified in item 2 or 4

### **c) Permitted without Consent**

Home occupations

### **d) Prohibited**

Agriculture; Air transport facilities; Airstrips; Amusement centres; Animal boarding or training establishments; Biosolids treatment facilities; Boat building and repair facilities; Boat launching ramps; Boat sheds; Camping grounds; Car parks; Caravan parks; Cemeteries; Charter and tourism boating facilities; Commercial premises; Correctional centres; Crematoria; Depots; Eco-tourist facilities; Entertainment facilities; Exhibition villages; Extractive industries; Farm buildings; Forestry; Freight transport facilities; Function centres; Heavy industrial storage establishments; Helipads; Highway service centres; Home occupations (sex services); Industrial retail outlets; Industrial training facilities; Industries; Information and education facilities; Jetties; Marinas; Mooring pens; Moorings; Mortuaries; Open cut mining; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation facilities (indoor); Recreation facilities (major); Registered clubs; Research stations; Residential accommodation; Restricted premises; Rural industries; Service stations; Sewerage treatment plants; Sex services premises; Signage; Storage premises; Tourist and visitor accommodation; Transport depots; Truck depots; Vehicle body repair workshops; Vehicle repair stations; Veterinary hospitals; Warehouse or distribution centres; Waste or resource management facilities; Water recreation structures; Water recycling facilities; Wharf or boating facilities; Wholesale supplies.

## **RU1 Primary Production**

### **a) Purpose/Objective**

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- To encourage diversity in primary industry enterprises and systems appropriate for the area
- To minimise the fragmentation and alienation of resource lands
- To minimise conflict between land uses within this zone and land uses within adjoining zones

### **b) Permitted with Consent**

Airstrips; Animal boarding or training establishments; Aquaculture; Bed and breakfast accommodation; Boat launching ramps; Boat sheds; Cellar door premises; Dual occupancies; Dwelling houses; Environmental facilities; Environmental protection works; Extractive industries; Farm buildings; Farm stay accommodation; Flood mitigation works; Forestry; Helipads; Home-based child care; Home businesses; Home industries; Intensive livestock agriculture; Jetties; Landscaping material supplies; Markets; Open cut mining; Plant nurseries; Recreation areas; Roads; Roadside stalls; Rural industries; Rural supplies; Signage; Turf farming; Water supply systems

### **c) Permitted without Consent**



Extensive agriculture; Home occupations; Intensive plant agriculture

**d) Prohibited**

Any other development not specified in item 2 or 3.

**e) Land dimensions to permit the erection of a dwelling house on the land**

For the land zoned RU1 Primary Production Clause 4.2A in the Maitland Local Environmental Plan 2011 applies to the land. This clause fixes a minimum lot size for the erection of a dwelling-house that is identified on the Maitland Local Environmental Plan 2011 Lot Size Map as 40 hectares. For the land zoned R5 Large Lot Residential the Maitland LEP 2011 does not contain a development standard specifying the land dimensions required to permit the erection of a dwelling house on the land.

**f) Critical Habitat**

No Local Environmental Plan or draft Local Environmental Plan identifies the land as including or comprising critical habitat.

**g) Conservation Area**

The land IS NOT in a Heritage Conservation Area.

**h) Item of Environmental Heritage**

The land does NOT contain an item of Environmental Heritage.

**3. Complying Development**

Complying development under the **General Housing Code** may not be carried out on the land as it is not within an applicable zone.

Complying development under the **Rural Housing Code** may be carried out on the land.

Complying development under the **Housing Alterations Code** may be carried out on the land.

Complying development under the **General Development Code** may be carried out on the land.

Complying development under the **Commercial and Industrial Alterations Code** may be carried out on the land.

Complying development under the **Commercial and Industrial (New Buildings and Additions) Code** may not be carried out on the land as it is not within an applicable zone.

Complying development under the **Subdivisions Code** may be carried out on the land.

Complying development under the **Demolition Code** may be carried out on the land.

Complying development under the **Fire Safety Code** may be carried out on the land.

Complying development under the **Container Recycling Facilities Code** may not be carried out on the land.

**Note:** Despite the above provisions, if only part of a lot is subject to an exclusion or exemption under Clause 1.17A or Clause 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) Amendment (Commercial and Industrial Development and Other Matters) 2013*, complying development may be carried out on that part of the lot that is not affected by the exclusion or exemption.

**4B. Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works**

The owner (or any previous owner) of the land has NOT consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

**5. Coal Mine Subsidence Compensation Act 2017**

The land has NOT been proclaimed to be within a Mine Subsidence District under the meaning of section 20 of the Coal Mine Subsidence Compensation Act 2017.

**6. Road widening and road realignment**

- a) The land is NOT affected by road widening under Division 2 of Part 3 of the Roads Act 1993.
- b) The land is NOT affected by any environmental planning instrument
- c) The land is NOT affected by any road-widening or realignment under any resolution of the Council

The information above relates to Council's road proposals only. Other authorities, including Roads and Maritime Services, may have proposals, which have not been set out.

**7. Council and other public authority policies on hazard risk restrictions**

All land within the Maitland Local Government Area has the potential to contain acid sulfate soils. Clause 7.1 of the Maitland Local Environmental Plan 2011 generally applies. Development consent is required where works described in the Table to this clause are proposed on land shown on the Maitland LEP 2011 Acid Sulfate Soils Map as being of the class specified for those works.

The Council has adopted a Contaminated Lands Policy to provide a framework to appropriately manage land contamination risk through the land use planning process. This Policy seeks to ensure that changes in land use will not increase the risk to human health or the environment. The Policy applies to all land in the Maitland Local Government Area.

**7A. Flood Related Development Controls**

Development on this land or part of this land for the purposes of dwelling houses, attached dwellings, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) IS subject to flood related development controls contained within clause 7.3 of the Maitland LEP 2011 and s.B3 of the Maitland DCP 2011.

Development on this land or part of this land for any other purpose IS subject to

flood related development controls contained within clause 7.3 of the Maitland LEP 2011 and s.B3 of the Maitland DCP 2011.

Information given in relation to flooding is based upon Council's adopted 1:100 ARI (Average Recurrent Interval) flood event.

The Maitland LEP 2011 identifies the flood planning level (FPL) as the level of a 1:100 ARI flood event plus 0.5m freeboard.

## **8. Land Reserved for Acquisition**

No environmental planning instrument, deemed environmental planning instrument or draft environmental planning instrument applying to the land provides for the acquisition of the land by a public authority, as referred to in section 3.15 of the Act.

## **9. Contribution Plans**

The following contribution plan(s) apply to the land:

- Maitland S94A Levy Contributions Plan 2006
- Maitland City Wide Section 94 Contributions Plan 2016
- 

Contributions Plans may be viewed on Council's website or inspected and purchased at Council's Customer Service Centre.

## **9A. Biodiversity Certified Land**

The land is not biodiversity certified land under Part 8 of the Biodiversity Conservation Act 2016.

## **10. Biodiversity Stewardship Sites**

The Council is not aware if the land is a biodiversity stewardship site under a biodiversity stewardship agreement under part 5 of the *Biodiversity Conservation Act 2016*.

## **10A. Native Vegetation clearing set asides**

The Council is not aware if the land contains a set aside area under 60ZC of the *Local Land Services Act 2013*.

## **11. Bushfire Prone Land**

The land is mapped as bushfire prone land and as such restrictions may apply to new development on this land.

## **12. Property vegetation plans**

The Council has not received any notification from Hunter Local Land Services that this land is affected by a property vegetation plan under Part 4 of the Native Vegetation Act 2003 (and that continues in force).

## **13. Order under Trees (Disputes between Neighbours) Act 2006**

Council has not received notification from the Land and Environment Court of NSW that the land is affected by an Order under Trees – (Disputes Between Neighbours) Act 2006.

#### **14. Directions under Part 3A**

There is NO direction by the Minister under Section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 (other than a project of a class prescribed by the regulations) of the Act does not have effect.

#### **15. Site Compatibility Certificate and Conditions for Seniors Housing**

##### **a) Site Compatibility Certificate**

Council is unaware of whether a current Site Compatibility Certificate issued under Clause 25 of the State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004 has been issued for the land.

##### **b) Conditions of Development Consent since 11 October 2007**

No development consent has been granted for the development permitted under State Environmental Planning Policy (Housing for Seniors and People with a Disability) 2004 after 11 October 2007.

#### **16. Site compatibility certificates for infrastructure, schools or TAFE establishments**

Council is unaware of whether a valid Site Compatibility Certificate has been issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 for the land.

#### **17. Site compatibility certificates and conditions for affordable rental housing**

Council is unaware if a Site Compatibility Certificate (Affordable Rental Housing) has been issued in accordance with State Environmental Planning Policy (Affordable Rental Housing) 2009.

#### **18. Paper subdivision information**

There is no development plan that applies to the:

- 1) Land or that is proposed to be subject to a consent ballot
- 2) There is no subdivision order that applies to the land.

#### **19. Site verification certificates**

Council is not aware of any current site verification certificate in respect of the land.

#### **20. Loose-fill asbestos insulation**

There are no premises on the subject land listed on the register.

#### **21. Affected building notices and building product rectification orders**

The Council is NOT aware of any affected building notice which is in force in respect of the land.

The Council is NOT aware of any building product rectification order which is in force in respect of the land and that has not been fully complied with.

The Council is NOT aware of any notice of intention to make a building product rectification order being given in respect of the land and that is outstanding.



**Note. The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate.**

**Contaminated Land**

- a) The land to which this certificate relates is NOT significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.
  - b) The land to which this certificate relates is NOT subject to a management order within the meaning of the Contaminated Land Management Act 1997.
  - c) The land to which this certificate relates is NOT the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.
  - d) The land to which this certificate relates is NOT the subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.
  - e) Council has NOT been provided with a site audit statement, within the meaning of the Contaminated Land Management Act 1997, for the land to which this Certificate relates.
- 

**David Evans**  
**General Manager**



HUNTER WATER CORPORATION  
A.B.N. 46 228 513 446

SERVICE LOCATION PLAN

Enquiries: 1300 657 657



APPLICATION NUMBER: 4640028329

APPLICANT NAME: InfoTrack

RATEABLE PREMISE NO.: 5174150083

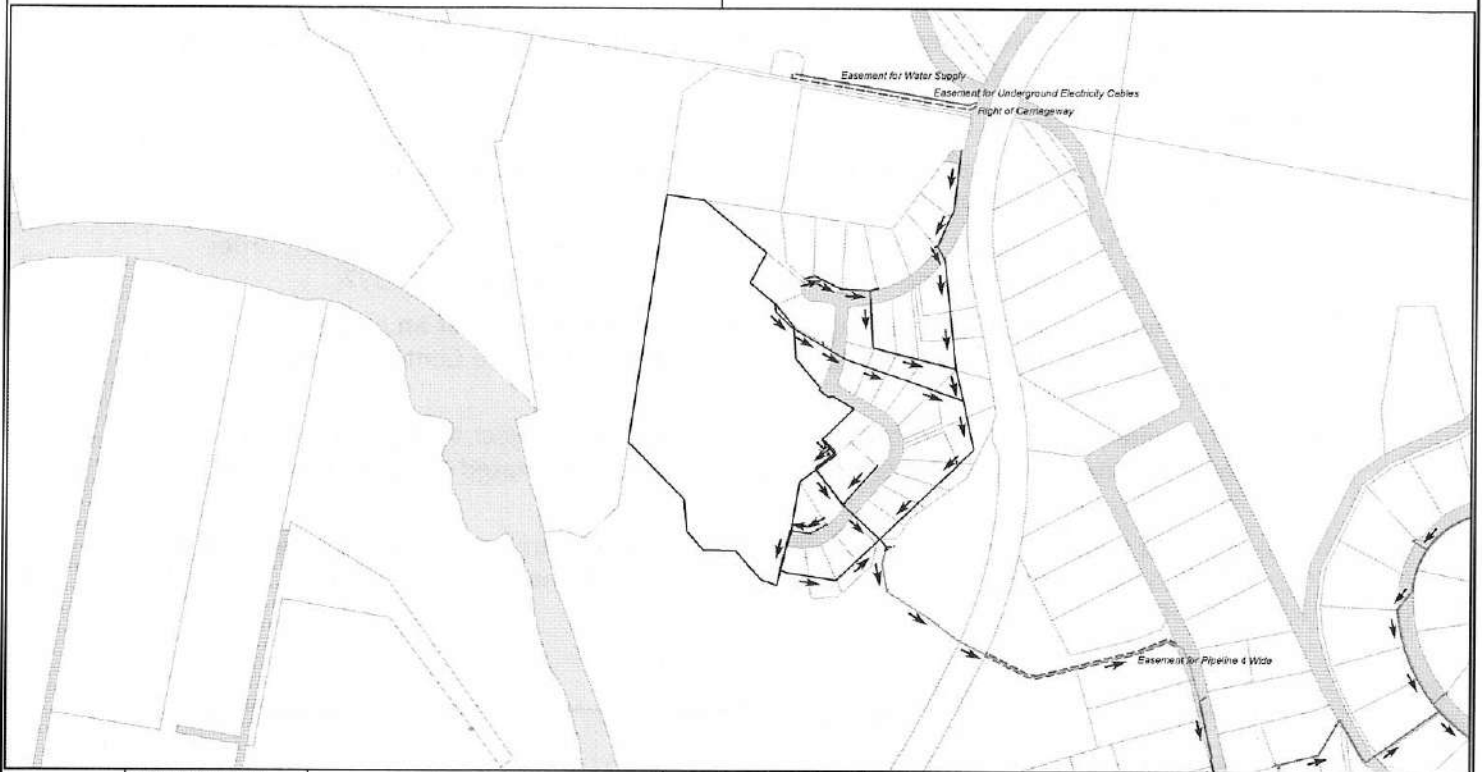
PROPERTY ADDRESS: 16 ESK CCT MAITLAND VALE 2320

LOT/SECTION/DP:SP: LOT/SECTION/DP:SP

APPLICANT REF: M 36876

N/A

N/A



Date: 18/05/2018	© DAST/SAL/DATA & LISTS OF NEW CONTOUR DATA © DAST/SAL/DATA & LISTS OF NEW CONTOUR DATA	IF A SEWERMAIN IS LAID WITHIN THE BOUNDARIES OF THE LOT, SPECIAL REQUIREMENTS FOR THE PROTECTION OF THE SEWERMAIN APPLY. IF DEVELOPMENT IS UNDERTAKEN IN THESE CASES, IT IS RECOMMENDED THAT YOU SEEK ADVICE ON THE SPECIAL REQUIREMENTS PRIOR TO PURCHASE. PHONE 1300 657 657, FOR MORE INFORMATION.	SEWER POSITION APPROXIMATE ONLY. SUBJECT PROPERTY BOLD. ALL MEASUREMENTS ARE METRIC.	IMPORTANT: IF THIS PLAN INDICATES A SEWER CONNECTION IS AVAILABLE OR PROPOSED FOR THE SUBJECT PROPERTY, IT IS THE INTENDING OWNERS RESPONSIBILITY TO DETERMINE WHETHER IT IS PRACTICABLE TO DISCHARGE WASTEWATER FROM ALL PARTS OF THE PROPERTY TO THAT CONNECTION. ANY INFORMATION ON THIS PLAN MAY NOT BE UP TO DATE AND THE CORPORATION ACCEPTS NO RESPONSIBILITY FOR ITS ACCURACY.
Scale: at A3 1:5,000	SEWER/WATER/RECYCLED WATER UTILITY DATA © HUNTER WATER CORPORATION			