

BUSHFIRE MANAGEMENT PLAN



PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2023/1400

Date: 24/10/2023



Lot 2 on SP110580

1 - 7 Cunningham Drive, Greenbank

Client Reference: 010.04.23



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DOCUMENT CONTROL**Bushfire Management Plan****Client:** Parmac Property Group**Client Reference:** 010.04.23**Project:** RoL and MCU**Site Location:** 1 - 7 Cunningham Drive, Greenbank

Version	Date	Status	Changes	Author	Approver
Rev 0	23.04.2023	First Draft		AH	AH
Rev 1	27.04.2023	Final Report		AH	AH

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1.0 Introduction

This Bushfire Management Plan (BMP) has been commissioned by the Parmac Property group in order to support a DA for the proposed subdivision of Lot 2 on SP110580 (the “Subject Lot”), creating one Residential Lot and a Childcare Lot.

Logan City Council (LCC) bushfire hazard overlay mapping classifies part of the Subject Lot as “bushfire prone area” (BPA). The hazard mapping is from data that is collected remotely to combine vegetation data with slope and aspect data, and arrive at a hazard rating based on a model specified in *A new methodology for State-wide mapping of bushfire prone areas in Queensland* (CSIRO 2014), reflected in *Bushfire Resilient Communities Technical Reference Guide* (BRC)(October 2019).

The designation by Council of land being BPA has a number of bushfire related implications:

1. It requires the production of a BMP which complies with the bushfire hazard overlay code of the Logan Planning Scheme 2015.
2. The BMP must demonstrate compliance against the development assessment benchmarks of *State Planning Policy – Natural hazards, risk and resilience – Bushfire* (December 2019); and must be consistent with the *Bushfire Resilient Communities Technical Reference Guide* (BRC)(October 2019).
3. Whilst childcare buildings (Class 9b) are not currently required by the BCA to conform to AS3959-2018 *Construction of buildings in bushfire prone areas*, the BCA has indicated that before the end of 2023 they will be required to comply. As a Duty of Care this Plan responds to the imminent requirement for compliance against this Standard.
4. The Work Health and Safety Act (2011) requires as a Primary Duty of Care of any Person Conducting a Business or Undertaking (PCBU) to ensure the health and safety of workers, so far as is reasonably practicable. Workers include volunteers, contractors and contractors’ workers. PCBUs also have the same duty of care to any other people who may be at risk from work carried out by the business.

This Bushfire Management Plan also addresses the State Planning Policy – Natural Hazards interim development assessment requirements, which ensure that State interests are appropriately considered in relation to natural hazards, including bushfire hazard areas.

It quantitatively determines the nature and severity of potential worst case wildfire in the area, and develops risk mitigation measures to be used in combination with established construction needs in accordance with *Bushfire Resilient Communities Technical Reference Guide* (October 2019) and AS3959-2018. It is the implementation of all these protection measures in combination, that demonstrates the viability and conformance of the proposed development in the development application process.

2.0 Site and Development Description

2.1 Property Description

Site ID:	Lot 2 on SP110580. Parish of Stapylton, County of Stanley.
Current address of property:	1 - 7 Cunningham Drive, Greenbank, QLD 4124.
Local Government Area:	Logan City Council.
Total Area:	5 150m ²
Zoning:	Priority Development Area

2.2 Proposed Development

The proposed development is planned to create one Residential Lot and a Childcare Lot.

2.3 Site Location and Layout



Figure 1. Broader Area showing the location of the proposed development.

Located south of Cunningham Drive and East of East Sentinel Drive, a residential Lot 50m wide separates the Subject Lot from a 4ha Lot supporting unmanaged open forest on flat ground. This area of unmanaged vegetation is not small enough to downgrade as Low hazard. At the same time, it does not align with the direction of worst case fire weather conditions, lessening its relative threat. Nevertheless, childcare is a “vulnerable use” and relevant bushfire protection measures must be taken to ensure that the associated risk can be deemed acceptable. This Plan establishes such protection measures, with particular emphasis on building construction, landscaping and emergency management arrangements, whilst demonstrating that the childcare facility does not face radiant heat flux of 10kW/m^2 , an important criterion for vulnerable use developments.



Figure 2. Proposed Site Plan.

Site access is via East Sentinel Drive, with multiple access/egress options along safe routes. The access to the new residential lot is via Cunningham Drive.

The area is serviced by reticulated town water supplies with hydrants providing water volumes and pressure under the control of Council's water utilities provider.

The site is within approximately 12km by road of the nearest Queensland Fire and Emergency Services (West Logan Fire Station), with Greenbank Rural Fire Station also potential responders.

3.0 Bushfire Hazard Assessment

3.1 Bushfire hazard classification

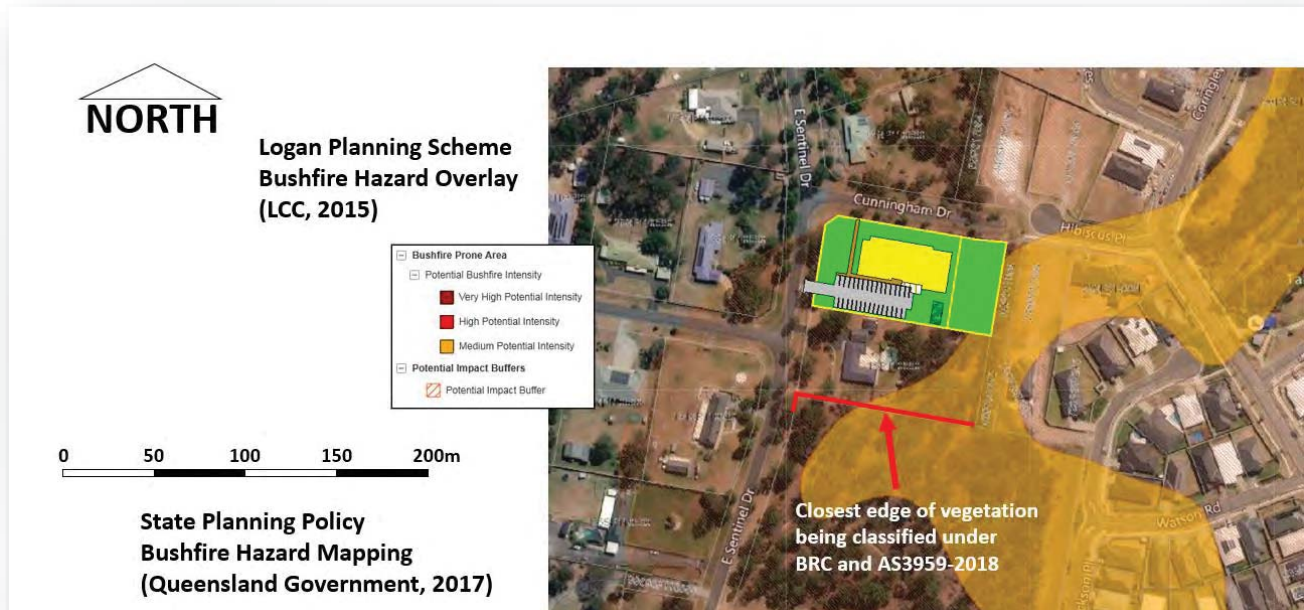


Figure 3. Council and State bushfire hazard mapping

“Bushfire Prone Area” (BPA) is defined under BRC, Section 7 of Building Regulation 2021 and the BCA as an area **identified as such by Local Government**, in this case using the methodology specified in *A new methodology for State-wide mapping of bushfire prone areas in Queensland* (CSIRO 2014). Logan City Council Policy 6 (Management of Bushfire Hazard) Part 2.1 outlines the requirement for a bushfire hazard assessment report based on such methodology in order to validate the bushfire hazard overlay mapping above.

It is argued that the purpose of Logan City Council Policy 6 (Management of Bushfire Hazard) Part 2.1 is ultimately to establish simply whether the site and bushland interface is BPA or not. This does not warrant a separate extensive report as inferred by Part 2.1.3, which would add complexity and cost to the process without achieving any more value than is achieved by the clear and concise approach taken by this BMP. This BMP achieves the same validation by stepping through Sections 3 (evidencing vegetation, fuel loads, slope, separation distances) and carrying this data forward to Section 6 (Fire weather characteristics and calculated fire parameters, based on the same (CSIRO) methodology). In the process it validates the future BPA status of the potential hazard interface to the south of the site.

The BCA calls up AS3959-2018 as providing “Deemed to Satisfy” construction levels for Class 1, 2 and 3 (and imminently Class 9) buildings and associated Class 10 structures constructed in bushfire prone areas. AS3959-2018 specifies building implications within 100m of designated bushfire prone land, or more strictly speaking, within 100m of intact, classified vegetation (50m in the case of grassland). This BMP establishes Bushfire Attack Levels (BALs) for the built environment on both new lots, comparing Methods 1 and 2 under AS3959-2018.

3.2 Vegetation Assessment, Slope and Separation Distances from Proposed Development

Figure 4 shows the area assessed which potentially affect the site to the south.



Figure 4. Vegetation and slope combinations for main fire scenario

In terms of AS3959-2018, vegetation type is taken as “Forest” and average slope beneath vegetation being classified is effectively Flat.

Section 6 objectively calculates and determines the potential nature and severity of bushfire attack more thoroughly. This serves as a basis for determining the construction and other bushfire protection measures outlined in this BAL Assessment.

Fuel assessments were evaluated using the Overall Fuel Hazard Assessment - DSE Victoria (Oct 2010), and compared to the default available fuel load values provided by State Government and used in Section 6, as required by BRC and AS3959.

3.3 Fuel Accumulation Assessment – Open forest south



Figure 5. Fuel Accumulation Assessment – Open forest south

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 29th March 2023	Open forest south		
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	High	High litter bed height 30 mm with High Near surface grassy fuels <i>Imperatur sp</i> , <i>Themeda sp</i> , <i>Lomandra sp</i> .	10 - 12
Elevated	Moderate	Canopy recruiters and <i>Acacia spp</i> , <i>Alphitonia sp</i> . Brush against vegetation occasionally.	2
Bark	High	Ribbon barks (<i>E.tereticornis</i>) otherwise lower bark hazard <i>A. leiocarpa</i> , <i>C.intermedia</i> , <i>L.confertus</i> .	2
Overall rating	High		14 - 16 t/ha

Table 2. Fuel Assessment Open forest south

Fuel accumulation values more than 20 years post fire will have reached close to their long term unmanaged stable state. The vegetation community present is consistent with mapped RE 12.9 – 10.12a (Vegetation Class 9.2) for which State Government assigns a default value for potential fuel load of 17.2t/ha.

A total available fuel load of 17.2t/ha (14.9t/ha of which is surface and near surface fuel) has been applied to fire modelling in Section 6.3.

4.0 Site constraints and environmental values which may limit mitigation options

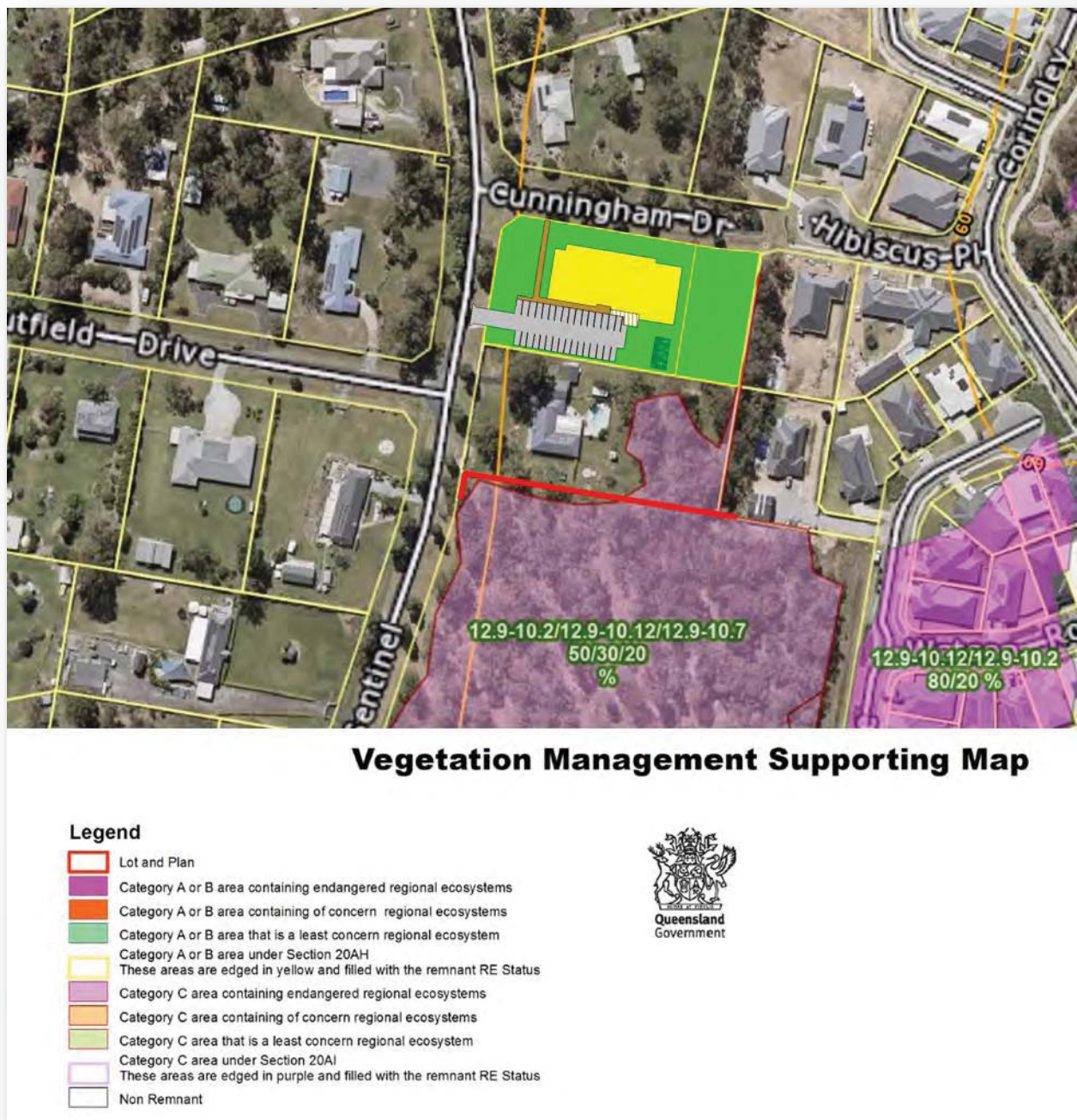


Figure 6. DNRME Regional Ecosystem Mapping

The Queensland Department of Natural Resources, Mines and Energy (DNRME) maps “Endangered” remnant vegetation of Regional Ecosystem (RE) 12.9 – 10.12a to the south of the site. Site assessment supports this classification.

DNRME provides the following RE Descriptions and optimal fire regimes summarized in Table 3 below.

Regional Ecosystem	RE Description	Optimal Fire Season Notes
RE 12.9 – 10.12a Endangered	<i>Eucalyptus interstans</i> , <i>Corymbia intermedia</i> , <i>E. tereticornis</i> +/- <i>C. tessellaris</i> , <i>E. siderophloia</i> , <i>Angophora leiocarpa</i> , <i>C. citriodora</i> woodland to open-forest. <i>Lophostemon suaveolens</i> is often present as a sub canopy or understorey tree. Occasional <i>Melaleuca quinquenervia</i> on lower slopes. Occurs on Cainozoic and Mesozoic sediments. Vegetation Hazard Class (VHC) 9.2 Potential Available Fuel Load 17.2t/ha	SEASON: Summer to winter. INTENSITY: Low to moderate. INTERVAL: 4-25 years. STRATEGY: Aim for 40-60% mosaic burn. Burn with soil moisture and with a spot ignition strategy so that a patchwork of burnt/unburnt country is achieved. ISSUES: The fire regime should maintain a mosaic of grassy and shrubby understoreys. Control of weeds is a major focus of planned burning in most areas. Careful thought should be given to maintaining ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas. Variability in season and fire intensity is important, as well as spot ignition in cooler or moister periods to encourage mosaics.

Table 2. Regional Ecosystem present

This analysis does not rely on hazard reduction burning and the temporary reduction in fuel loads that would result.

Planning is based on fuel levels reaching a long term maximum stable state, coinciding with ignition under worst case foreseeable fire weather conditions.

4.1 Fire History and Frequency

This study found no evidence of recent fire in the area. Occurrence of fire is anticipated, potentially coinciding with full potential fuel accumulation and worst case fire weather conditions.

5.0 Specific risk factors associated with the development proposal

5.1 Nature of activities anticipated on site

Normal childcare and residential activities are anticipated to occur in the area, with pupils and teachers having immediate access to the childcare building, which would provide sufficient shelter in the event of fire in the limited area of forest vegetation to the south. The proposed development adds to the number of people in the area and potentially exposed to bushfire, however this Plan serves to reduce the associated risk to acceptable levels.

5.2 Numbers of people likely to be present

The childcare facility anticipates up to 120 children and 22 staff being present. Normal operating hours are 6am to 7pm during weekdays.

6.0 Nature and Severity of Potential Bushfire Attack

6.1 Bushfire season and Fire Weather

The “typical fire season” in this area peaks between September and November. The predominant winds in the area are south easterly, however during the fire season, hot gusty westerlies of over 30 kph can be expected, with Relative Humidity falling to 10% and less. Temperatures on these days can climb over 35°C , and for two or three days a year, fire weather conditions equivalent to FDI levels of around 50 - 60 can be anticipated. (Note that this is in contrast to the value of 40 which Queensland is currently using in the recently revised AS3959 - 2018).

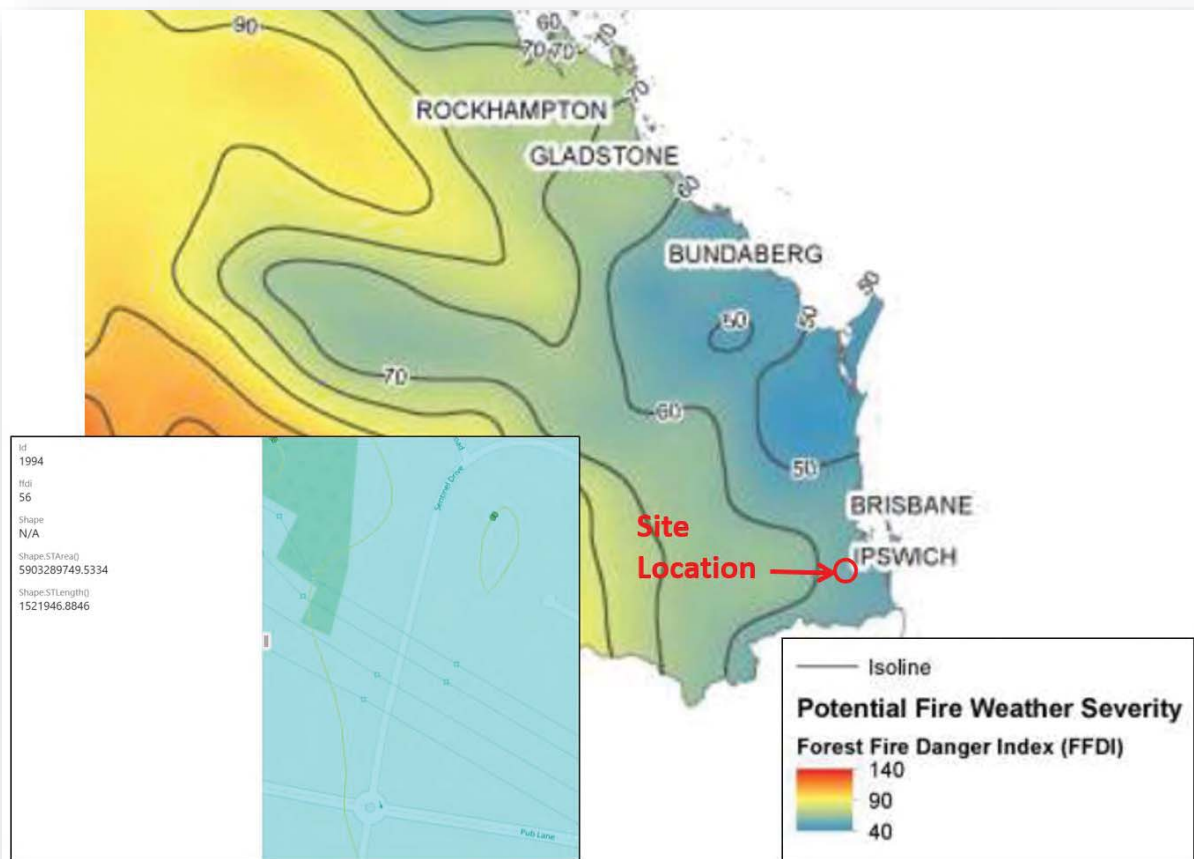


Figure 7. State Government revised FDI values to FDI 56 for the area involved. (QFES Catalyst, 2023).

6.2 Anticipated direction of bushfire attack

The anticipated direction of bushfire attack is from the south, not aligned with the worst case fire weather conditions for the area (westerly through NW to northerly).

Bushfire attack comes in a number of forms: direct flame, radiant heat, embers, smoke and wind. Research shows that over 80% of houses lost to bushfire in Australia can be attributed to ember attack, within 100m of bushland.

The bark hazard in the adjacent vegetation could be expected to generate some ember attack for closest elements of the proposed facility.

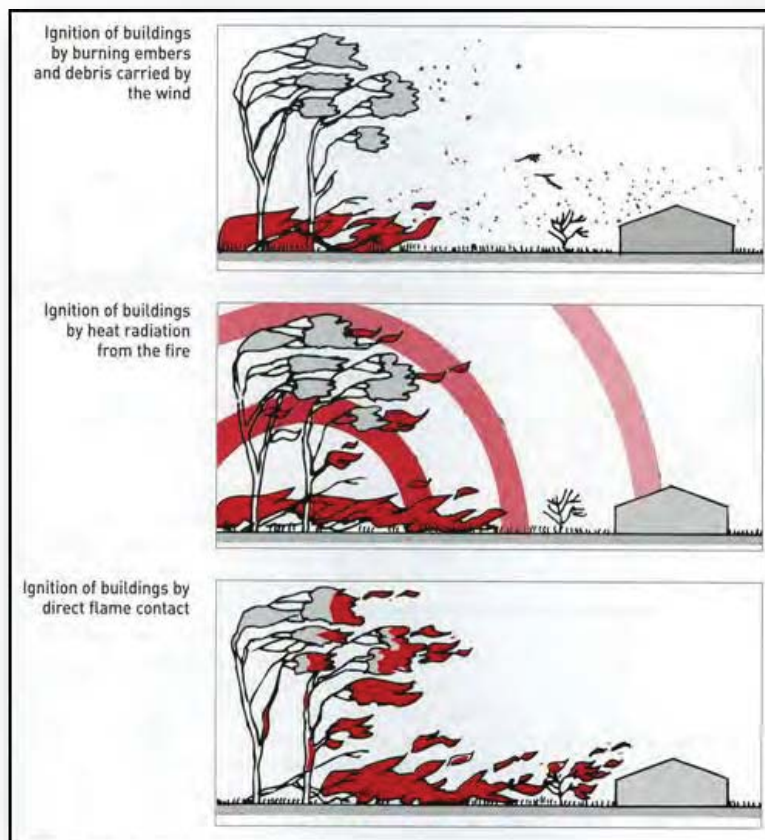


Figure 8. Main Bushfire Attack mechanisms (Image courtesy of Ramsay & Rudolf, 2003)

6.3 Anticipated severity of bushfire attack

Fire Scenario – Open forest south BRC and Method 2 AS3959-2018 FDI 56 Forest @ 14.9/17.2t/ha. Effective Slope under vegetation 0°	Fire Scenario – Open forest south Method 1 AS3959-2018 FDI 40 Forest Effective Slope under vegetation 0°
Fire Intensity (Byram, 1959) 8 898kW/m (“MEDIUM”)	
Rate of Spread (Noble et al, 1980) 1.00kph	
Flame Height (modified Mc Arthur V equation, NSW RFS 2001) 8.56m	
Flame Width 100m	
Elevation of Receiver 2.4m	
BAL FZ within <8m of intact unmanaged vegetation BAL 40 from 8 - <10m BAL 29 from 10 - <15m BAL 19 from 15 - <22m BAL 12.5 from 22 - <100m (BAL 10 @ 26m)	BAL FZ within 10m of intact unmanaged vegetation BAL 40 from 10 - <13m BAL 29 from 13 - <20m BAL 19 from 20 - <28m BAL 12.5 from 28 - <100m

Table 4. Calculated fire values for the vegetation types present.

The potential fire scenario is modelled by Method 2 under AS3959-2018 and compared in Table 4 and Figure 9 below. Potential Fire line Intensity is comparable with State bushfire hazard mapping which indicates “medium” intensity (4 - 20 000kW/m).

The radiant heat flux values are plotted against separation from intact vegetation, and are reflected as Bushfire Attack Levels (BALs) in Figure 11.

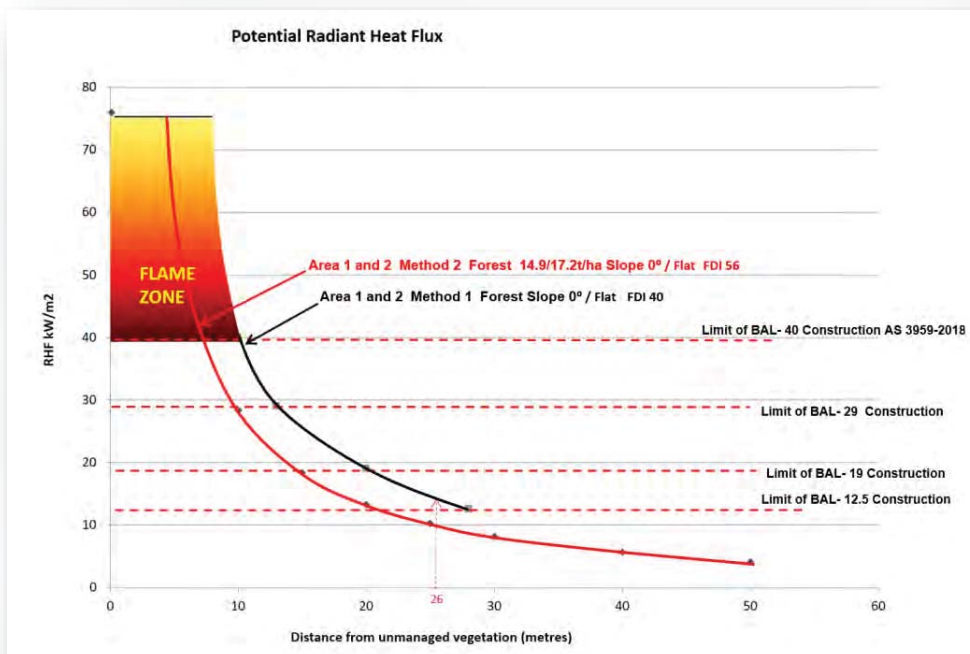


Figure 9. Radiant Heat Flux Predicted by Methods 1 and 2.

Site specific fire modelling by Method 2 predicts a lesser fire, with lesser radiant heat flux generated, compared to Method 1.

The proposed childcare building and the future dwelling on the new residential lot require construction to a minimum of BAL 12.5 under AS3959-2019. Any Class 10 structure built within 6m of either building will also need to be constructed in accordance with this Standard.

State Planning Policy – Natural hazards, risk and resilience – Bushfire, and BRC targets a maximum radiant heat flux value of 10kW/m² at development footprint boundaries. The Subject Lot is 50m from the closest hazard, with radiant heat exposure substantially less than 10kW/m².

In the event that pupils and staff need to shelter from fire (with insufficient time to safely evacuate) the childcare building is large enough to accommodate them, and capable of being sealed securely against smoke entry to protect occupants.

The significance of the radiant heat flux levels discussed is shown below in Table 5.

Radiant Heat Flux (kW/m ²)	Likely Effects
> 40 - 110	Flame Zone. Even the strongest toughened glass fails.
29 - 40	Latest technology in toughened glass may survive. Most will not. Timber ignites without pilot flame. Limit of BAL-40 Construction AS3959 - 2018.
29	Ignition of timbers without piloted ignition (3 minutes exposure) during the passage of a bushfire. Most types of toughened glass could fail. Limit of BAL-29 Construction AS3959 - 2018.
19	Screened float glass could fail during the passage of a bushfire. Limit of BAL-19 Construction AS3959 - 2018.
12.5	Standard float glass could fail during the passage of a bushfire. Limit of BAL-12.5 Construction AS3959 - 2018. Some timbers can ignite with prolonged exposure and with pilot ignition sources (eg embers)
10	Critical conditions. Firefighters not expected to operate in these conditions. Considered life threatening in under a minute in protective equipment. Fabrics inside a building could ignite spontaneously with long exposures.
7	Likely fatal to unprotected persons after exposure of several minutes.
4.7	Extreme conditions. Firefighter in protective clothing will feel pain after 60 seconds exposure.
3	Hazardous conditions. Firefighters expected to operate for a short period (10 minutes).
2.1	Unprotected person will feel pain after 1 minute exposure - non fatal.

Table 5. Significance of various RHF levels (Source: NSW RFS, 2006)

7.0 Bushfire Protection Measures in Combination



Figure 10. Bushfire Planning Measures in Combination (Source: NSW RFS, 2006)

Figure 10, taken from *Planning for Bushfire Protection* (NSW Rural Fire Service, 2006) illustrates that there are other factors and measures which need to be integrated to mutually support one another in providing protection against bushfire.

Simply removing the hazard (bushland) is one possible way of removing risk to life and property, but this approach is not desirable. The safety of life and property can be achieved whilst retaining the natural amenity and value of bushland areas, provided these integrated bushfire protection measures are applied.

7.1 Building Construction and Design

The proposed childcare building and the future dwelling on the new residential lot require construction to a minimum of BAL 12.5 under AS3959-2019. Any Class 10 structure built within 6m of either building will also need to be constructed in accordance with this Standard.

Figure 11 shows the reach of BAL ratings that would apply to the site if the BCA included school buildings. The location of the 10kW/m² contour is shown in Figure 11.



Figure 11. Proposed Layout and BAL contours for the new lots.

7.2 Asset Protection Zones and Landscaping

Asset protection zones are the most strategically valuable defense against radiant heat and flame, and to a lesser extent embers.

The landscaping plan for the site should maintain an “Inner Protection Area” (IPA) for the entire unbuilt portion of both, effectively free of available fuel.

- Plants retained in or introduced into the IPA should be selected based on low combustibility, by virtue of high moisture content, low volatile oil content, high leaf mineral levels, large fleshy leaves, absence of shedding bark.
- Plant arrangement is just as important as low combustibility. Plants should be placed so as to minimize either vertical or horizontal connectedness of plant material. Appendix 1 provides examples of less hazardous native plant species.
- Combustible vegetation shall not be allowed to come into contact with combustible parts of buildings and garden beds should not be located directly adjoining built form.
- Trees should not be allowed to directly overhang roof lines.
- Regular yard maintenance should be undertaken to remove available fine fuels and debris, particularly throughout the fire season.

An Outer Protection Area involves removal of the understorey so as to deprive an advancing fire front of its fuel continuity, and thereby collapsing the fire front. In this case the APZ for the new lots will be maintained as IPA.

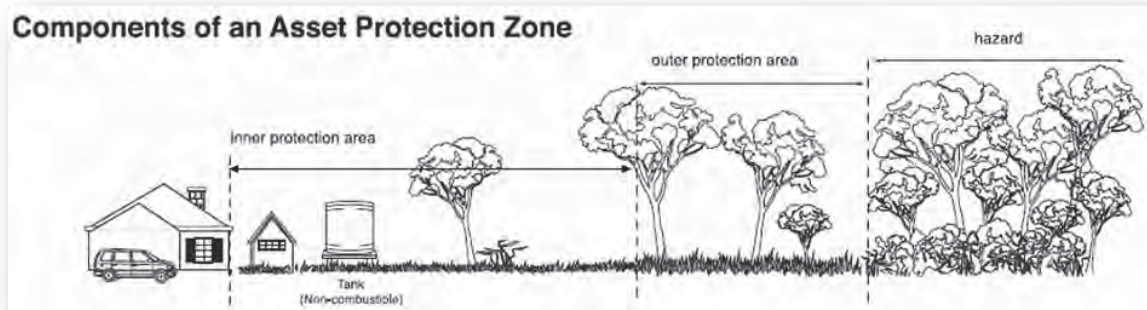


Figure 12. Components of an Asset Protection Zone (APZ)

7.3 Access and Egress Management

The site is within approximately 12km by road of the nearest Queensland Fire and Emergency Services (West Logan Fire Station), with Greenbank Rural Fire Station also potential responders.

The proposed car parking area and existing roadways provide suitable access with turning facilities for emergency services vehicles with > 6m inner radius / > 12m outer radius with three point turning options.

Multiple egress options are available for evacuation via East Sentinel Drive, with at least one safe option.

Access and egress for fire fighters will be provided in accordance with the Queensland Fire and Emergency Services Guideline (*Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots, 2015*). The guideline is attached as Appendix 2.

Access to all sides of the buildings shall be preserved free of obstructions for fire fighters on foot.

7.4 Water Supplies and Utilities

The site will be provided with reticulated water supply fully installed in accordance with AS2419.1 (2005), under the control of Councils water supply service provider, with a minimum pressure and flow of 10 litres a second at 200kPa at all times. Fire fighting water supply and fire hydrants will be provided in accordance with the Queensland Fire and Emergency Services Guideline (*Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots, 2015*).

Electricity supply to the site is supplied underground.

Any reticulated or bottled gas shall be installed and maintained in accordance with AS1596 – 2002. Metal piping is to be used. Any fixed LPG tanks shall be kept clear of flammable materials, and located on the non hazard side of the building. Any gas cylinders which need to be kept close to a building shall have release valves

directed away from the building. Polymer sheathed flexible gas supply lines to gas meters adjacent to buildings are not to be used.

7.5 Fire Fighting and Emergency Management Arrangements

The development is serviced by existing roads and proposed carparks for Emergency Services use. Asset Protection Zone maintenance prevents a development of hazard within the childcare grounds ensuring that defense of buildings can be safely conducted.

Obstructions to access around the proposed buildings should be avoided.

Childcare operators and staff shall be made aware of the existence of this Plan, and their need to comply with the relevant provisions, in particular APZ maintenance, optimizing access around buildings and emergency response preparations. This Plan compliments the schedule of inspection conducted regularly by QFES which deals primarily with structural fire.

In the event of fire threatening the site, evacuation would only be considered if it is safe to do so and given the logistics of moving all children and staff this may not be possible. The assessment of the hazard provided demonstrates that it is probably safer and more practical for children and staff to shelter in situ until the threat has passed, rather than attempt late evacuation and become potentially exposed to smoke and other hazards outdoors.

The proposed childcare building is large enough to accommodate pupils and staff and capable of being sealed securely against smoke entry to protect occupants. The reverse cycle air conditioning should be used to provide cooling of air inside the building and to exclude smoke. Emergency management plans for the site should include sheltering indoors in the event of bushfire

Any Staff intending to defend the premises (whether or not there are other site users present) should ensure that they have adequate protective clothing, including full length cotton or denim garments, sturdy boots, gloves, smoke mask (minimum P2 with valves) and smoke goggles.

8.0 8.0 Assessment of proposal against Logan Planning Scheme 2015 – Part 8.2.3 Bushfire Hazard Overlay Code

Performance Outcomes	Acceptable Outcomes
8.1 (PO1) Development is designed to: (a) minimise risk of bushfire hazard; (b) provide safe premises; (c) create efficient emergency access for firefighting and other emergency vehicles.	Acceptable Outcome AO1 is applied in that: Development: (a) increases the number of persons living in, or lots in, the Bushfire hazard area identified on Bushfire hazard overlay map– OM–03.00; however the risk posed by bushfire is mitigated by this Plan.
8.2 (PO2) Development is sited and constructed to minimise the bushfire hazard and maximise the protection of life and property from bushfire.	Acceptable Outcome AO2 is applied in that: Development is located and constructed: (a) where there is no bushfire management plan approved by an existing development approval: (i) such that the bushfire attack level for future buildings is less than or equal to BAL–29; (ii) away from the most likely direction of a fire front; (iii) so that generally elements of the development least susceptible to fire (car parks) are sited closest to the bushfire hazard; (iv) such that asset protection zones are sited on land with a slope less than 18 degrees; (v) such that asset protection zones are entirely within the boundaries of the private property of the development site;
8.3 (PO3) Reconfiguring a lot ensures that lots are designed to minimise bushfire hazard and provide safe sites for people, property and buildings.	Acceptable Outcome AO3 is applied in that: Lots: (a) are suitable for people, property and buildings by: (i) having a bushfire attack level less than or equal to BAL–29; (b) provide asset protection zones that: (i) are located on land with a slope less than 18 degrees; (ii) are located on the same lot.
8.4 (PO4) Vehicular Access and Fire Maintenance Trails Access for fire management and evacuation is provided by access that: (a) separates premises from adjoining vegetation; (b) is safely accessible by fire fighting vehicles; (c) has regular vehicular access points for bushfire management, response and evacuation; (d) has regular vehicle passing and turning areas for bushfire management, response and evacuation;	Acceptable Outcome AO4 is applied to the extent that: Access for fire management and evacuation is provided by existing ,and planned internal roadways, and (d) is constructed to otherwise comply with Section 3.4 – Movement infrastructure standards of PSP5 – Infrastructure; and

(e) allows access at all times for fire fighting vehicles; (f) allows for maintenance, burning off and bushfire response; (g) has vehicular links to an alternative through road; (h) is readily maintained.	
8.5 (PO5) Water Supply Development has access to adequate water supply for fire fighting purposes.	Acceptable Outcome AO5 is applied in that: Development: (a) is connected to a reticulated water supply scheme that has sufficient flow and pressure characteristics for fire fighting purposes at all times with a minimum pressure and flow of 10 litres per second at 200kPa.
8.6 (PO6) Community Infrastructure Community infrastructure is not located in a bushfire hazard area or is able to function effectively during and immediately after a bushfire event.	Acceptable Outcome AO6 is applied to the extent that the infrastructure involved does not involve vital core services to the community.
8.7 (PO7) Hazardous Materials Public safety and the environment are not adversely affected by the adverse impacts of bushfire on hazardous materials including fuels, explosives and flammable chemicals manufactured or stored in bulk on premises.	Acceptable Outcome AO6 is applied to the extent that: The proposed Development does not involve the manufacture or storage of hazardous materials in bulk.

9.0 Assessment of proposal against State Planning Policy 2019

State Planning Policy – Natural hazards, risk and resilience (SPP, December 2013, latest version October 2019) replaces State Planning Policy 1/03 *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*. The SPP *Natural hazards, risk and resilience – Bushfire* provides a methodology for determining Bushfire Hazard based on Potential Fireline Intensity. The methodology and hazard mapping has been included in Section 3.1 of this Plan in establishing the adjacent area to the west as potentially hazardous and as a bushfire prone area.

The *State interest guidance material* supporting the SPP contains assessment benchmarks to ensure that State interests are appropriately considered in relation to natural hazards, including bushfire hazard areas. These provisions serve as general guidelines to either avoid or otherwise adequately mitigate bushfire risk.

Development Assessment Benchmarks	Solutions Provided
(3) Development avoids natural hazard areas or where it is not possible to avoid the natural hazard area, development mitigates the risks to people and property to an acceptable or tolerable level, and	This Plan establishes the nature and potential severity of the adjacent hazard and provides a combination of bushfire protection measures to mitigate risk including building construction, asset protection zones, access, water supplies and utilities, and emergency management arrangements.

(4) Development supports, and does not unduly burden, disaster management response or recovery capacity and capabilities, and	The combined effect of the bushfire protection measures specified by this Plan serves to reduce risk to a low level and ensure resilience and preparedness for unplanned fire so that the response or recovery capacity and capability of emergency services is not unduly burdened or impeded. This Plan serves to protect life and property from bushfire without depending on emergency services for protection.
(5) Development directly, indirectly and cumulatively avoids an increase in the severity of the natural hazard and the potential for damage on the site or to other properties, and	The development does not increase the nature of the existing hazard, and site layout and landscaping on the site is designed to moderate the exposure of buildings. The potential for damage to other properties is not increased as a consequence of the proposed development.
(6) Risks to public safety and the environment from the location of hazardous materials and the release of these materials is avoided, and	Hazardous materials are not stored in quantities or locations on the site which would pose a risk to the public or the environment.
(7) The natural processes and the protective function of landforms and the vegetation that can mitigate risks associated with the natural hazard are maintained or enhanced.	The development maintains the natural processes and protective function of vegetation that previously existed for the site.

10.0 Recommendations

1. The proposed childcare building and the future dwelling on the new residential lot require construction to a minimum of BAL 12.5 under AS3959-2019. Any Class 10 structure built within 6m of either building will also need to be constructed in accordance with this Standard.
2. The Asset Protection Zones described in Sections 6.3 and 7.2 of this report shall be constructed and maintained for the entire area of the site. Plants compatible with IPA (Section 7.2) may be planted as part of landscaping on the childcare centre grounds, otherwise only canopy trees should be retained, with a mown surface beneath them.
3. Reticulated water supplies accessed via hydrants and fire hydrants will be provided in accordance with the Queensland Fire and Emergency Services Guideline (*Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots, 2015*).
4. It is recommended that Emergency Management arrangements for external fire (bushfire) are formalised and practised, as they are different from internal fire (structural fire). This includes practicing sheltering in place amongst other emergency management drills.
5. Childcare operators and staff should be made aware of the existence of this Plan and their responsibilities outlined within it, in particular access to water, asset protection zone maintenance and emergency management.
6. Deviation from the actions or recommendations outlined in this Plan will require notification of the Author and potentially reworking bushfire protection measures accordingly. Should the area be impacted by unplanned bush fire, this Plan should be reviewed for adequacy, and potentially be revised to account for conditions that are different to those existing at the time of preparing this Plan.

11.0 Summary

The area of “hazard” faced by the proposed development is limited in area, restricting the ability of fire to develop in intensity. The hazard is not aligned with the direction of worst case fire weather conditions but the likelihood of bushfire is regarded as possible over the long term. The likely adverse consequences of bushfire are minimised as a result of this Plan, and the current design of the proposal.

Along with adequate water supply and emergency management arrangements and APZs to reduce the exposure of life and property to bushfire, these combined measures assist prepare the childcare centre and residential lot for the possibility of fire in the area.

12.0 References

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Appendix 1

Less combustible native plants list

Source: Bowden, J (1999)

10

APPENDIX

Fire Retardant Native Plants

Form: S = Shrub; T = Tree; V = Vine; H = Herb; Gc = Ground cover; eO = epiphytic Orchid; eF = epiphytic Fern; tF = terrestrial Fern.

Fire-retardance: Lm = due to leaf water contents; St = due to salt content; SI = succulent leaves

Comments: Wb = suitable for windbreak/fire barrier; Ad = suitable as addition to windbreak/fire barrier but not as main species; Us = suitable for understory of windbreak/fire barrier; Oa = suitable for open areas near house; Sa = suitable for sheltered areas near house; PF = suitable if protected from direct flames; De = Deciduous in winter, in flower or in dry periods

(-) = may not occur naturally in Pine Rivers Valley but has not proved invasive.

Fire-Retardant Plants for Small Gardens

Scientific Name	Common Name	Form	Fire Retardance	Comments
GYMNOSPERMS				
Zamiaceae				
<i>Lepidozamia peroffskyana</i>	Shining Burrawang	S	Lm	Us Sa
<i>Macrozamia lucida</i>	Pineapple Zamia	S	Lm	Us Sa
<i>Macrozamia miquelii</i>	Wild Pineapple	S	Lm	Us Oa Sa
Agavaceae				
<i>Cordyline petiolaris</i>	Broad-leaf Palm Lily	S	Lm	Us Sa
<i>Cordyline rubra</i>	Red-fruit Palm Lily	S	Lm	Us Sa
<i>Cordyline stricta</i>	Slender Palm Lily	S	Lm	Us Sa
MONOCOTYLEDONS				
Amariyllidaceae				
<i>Crinium pedunculatum</i>	River Lily	H	Lm SI	Us Oa Sa
<i>Doryanthes palmeri</i> (-)	Spear Lily	H	Lm SI	Us Oa Sa
<i>Proiphys cunninghamii</i>	Brisbane Lily	H	Lm SI	Us Sa
Araceae				
<i>Alocasia brisbanensis</i>	Cunjevoi	H	Lm	Us Sa
<i>Gymnostachys anceps</i>	Settlers Flax	H	Lm	Us Sa
<i>Pothos longipes</i>	Pothos	V	Lm	Us Sa
<i>Typhonium brownii</i>	Stinking Lily	H	Lm	Us Sa
Arecaceae				
<i>Livistona monostachya</i>	Walking Stick Palm	P	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Commelinaceae				
<i>Aneilema acuminatum</i>	Aneilema	H Gc	Lm	Us Sa
<i>Aneilema biflorum</i> (-)	Aneilema	H Gc	Lm	Us Sa
<i>Commelina cyanea</i>	Scurvy Plant	H Gc	Lm	Us Op Sa
<i>Politia crispata</i>	Snake Weed	H Gc	Lm	Us Sa
<i>Politia macrophylla</i>	Large Snake Weed	H Gc	Lm	Us Sa
Dioscoreaceae				
<i>Dioscorea transversa</i>	Native Yam	V	Lm	Us Sa
Liliaceae				
<i>Bulbine bulbosa</i> (-)	Bulbine Lily	H	Lm SI	Oa
<i>Dianella brevipedunculata</i>	Blue Flax Lily	H	Lm	Us Oa Sa
<i>Dianella caerulea</i>	Blue Flax Lily	H	Lm	Us Oa Sa
<i>Dianella revoluta</i>	Flax Lily	H	Lm	Us Oa Sa
<i>Drynophila moorei</i> (-)	Orange Berry	H	Lm	Us Sa
<i>Tripladenia cunninghamii</i>	Bush Lily	H	Lm	Us Sa
Orchidaceae				
<i>Dendrobium gracilicaule</i>	Spotted Orchid	eO	Lm	Sa
<i>Dendrobium X gracillimum</i>	Natural Hybrid	eO	Lm	Sa
<i>Dendrobium monophyllum</i>	Lily of the Valley			
	Orchid	eO	Lm	Sa
<i>Dendrobium schoenitum</i>				
(<i>D. beckeri</i>)	Pencil Orchid	eO	Lm	Sa
<i>Dendrobium spectosum</i>	King Orchid	eO	Lm	Sa
<i>Dendrobium teretifolium</i>	Bridal Veil Orchid	eO	Lm	Sa
<i>Dendrobium tetragonum</i>	Spider Orchid	eO	Lm	Sa
Philetiaceae				
<i>Eustrephus latifolius</i>	Wombat Berry	V	Lm	Us Oa Sa
<i>Geitonoplesium cymosum</i>	Scrambling Lily	V	Lm	Us Sa
Phylidraceae				
<i>Phylidrum lanuginosum</i>	Frogsmouth	aH	Lm SI	Oa Wet areas
Smilacaceae				
<i>Smilax glycyphylla</i>	Sweet Sarsparilla	V	Lm	Us Sa
Xanthorrhoeaceae				
<i>Lomandra confertifolia</i>	Mat Rush	H	Lm	Oa
<i>Lomandra hystrix</i>	Creek Mat Rush	H	Lm	Us Sa
<i>Lomandra longifolia</i>	Long-leaf Mat Rush	H	Lm	Us Oa Sa
<i>Lomandra filiformis</i>	Fine-leaf Mat Rush	H	Lm	Oa
<i>Lomandra multiflora</i>	Many-flower Mat Rush	H	Lm	Oa
<i>Lomandra spicata</i>	Mountain Mat Rush	H	Lm	Us Oa Sa
Zingiberaceae				
<i>Alpinia arundeliana</i>	Wild Ginger	H	Lm	Us Sa
<i>Alpinia coerulea</i>	Native Ginger	H	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
DICOTYLEDONS				
Alzooaceae				
<i>Carpobrotus glaucescens</i>	Pig Face	H Gc	Lm Sl	Oa
Acanthaceae				
<i>Gratiophyllum excelsum</i> (-)	Scarlet Fuchsia	S	Lm	Us Sa
<i>Gratiophyllum spinigerum</i>	Sanford Holly	S	Lm	Us Sa
<i>Pseuderanthemum tenellum</i>	Pseuderanthemum	H	Lm	Us Sa
<i>Pseuderanthemum variabile</i>	Love Flower	H	Lm	Us Sa
Apiaceae				
<i>Centella australis</i>	Pennywort	H Gc	Lm	Oa
<i>Hydrocotyle acutiloba</i>	Pennywort	H Gc	Lm	Us Sa
<i>Hydrocotyle pedicellosa</i>	Pennywort	H Gc	Lm	Us Sa
Apocynaceae				
<i>Alyxia ruscifolia</i>	Chain fruit	S	Lm	Us Sa
<i>Carissa ovata</i>	Current Bush	S	Lm	Us Oa Sa
<i>Neisosperma poweri</i> (-)	Milkbush	S	Lm	Us Sa
<i>Ochrostia moorei</i> (-)	Southern Ochrosia	S	Lm	Us Sa
<i>Parsonsia lenticellata</i>	Narrow-leaf Silkpod	V	Lm	Us Sa
<i>Parsonsia lilacina</i>	Delicate Silkpod	V	Lm	Us Sa
<i>Tabernaemontana pandacqui</i>	Banana Bush	S	Lm	Us Sa
Aristolochiaceae				
<i>Aristolochia</i> sp. aff. <i>pubera</i>	Pipe Vine	V	Lm	Us Sa
<i>Aristolochia praevanosa</i>	Richmond Birdwing Vine	V	Lm	Us Sa
Asclepiadaceae				
<i>Hoya australis</i>	Wax Flower	V	Lm	Us Sa
<i>Marsdenia longiloba</i>	Slender Milk Vine	V	Lm	Us Sa
<i>Secamone elliptica</i>	Corky Milk Vine	V	Lm	Us Sa
<i>Tylophora paniculata</i>	Thin-leaf Tylophora	V	Lm	Us Sa
Bignoniaceae				
<i>Pandorea floribunda</i>	New sp. Pine R	V	Lm	Us Oa Sa
<i>Pandorea jasminoides</i>	Bower of Beauty	V	Lm	Us Oa Sa
Caesalpiniaceae				
<i>Cassia artemisioides</i> (-)	Silver Cassia	S		Oa
Campanulaceae				
<i>Lobelia trigonocaulis</i>	Forest Lobelia	H Gc	Lm	Us Oa
<i>Wahlenbergia gracilis</i>	Bluebells	H		Oa
Capparidaceae				
<i>Capparis arborea</i>	Native Caper	S/T	Lm	Us Sa
<i>Capparis sarmentosa</i>	Scrambling Caper	V	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Celastraceae				
<i>Cassine australis</i>	Red Olive Berry	S/T	Lm	Us Sa
<i>Denhamia celastroides</i>	Orange Boxwood	S/T	Lm	Us Sa
<i>Denhamia pittosporoides</i>	Orange Boxwood	S/T	Lm	Us Sa
<i>Maytenus bilocularis</i>	Orangebark	S/T	Lm	Us Sa
Chenopodiaceae				
<i>Einadia hastata</i>	Berry Salt Bush	S Gc	St	Oa
<i>Enchylaena tomentosa</i>	Ruby Salt Bush	S Gc	St Sl	Oa
<i>Halosarcia indica</i>	Samphire	S Gc	St Sl	Oa Salty soil
<i>Sarcocornia quinqueflora</i>	Samphire	S Gc	St Sl	Oa Salty soil
<i>Suaeda australis</i>	Seablite	S Gc	St Sl	Oa Salty soil
<i>Suaeda arbusculoides</i>	Jellybean Plant	S Gc	St Sl	Oa Salty soil
Convulsiaceae				
<i>Convululus erubescens</i>	Australian Bindweed	V	Lm	Oa
<i>Dichondra repens</i>	Kidney Weed	H Gc	Lm	Us Sa
<i>Polymeria calycina</i>	Swamp Bindweed	V	Lm	Oa
Cunoniaceae				
<i>Aphanopetalum resinolum</i>	Gum Vine	V Gc	Lm	Us Sa
<i>Vesselowskyia rubifolia</i> (-)	Southern Marara	S/T	Lm	Us Sa
Davidsoniaceae				
<i>Davidsonia pruriens</i> (-)	Davidson's Plum	T	Lm	Us Sa
Dilleniaceae				
<i>Hibbertia aspera</i>	Rough Guinea Flower	S	Lm	Oa
<i>Hibbertia dentata</i>	Toothed Guinea Flower	V	Lm	Us Oa Sa
<i>Hibbertia linearis</i>	Showy Guinea Flower	S	Lm	Oa
<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower	S	Lm	Oa
<i>Hibbertia stricta</i>	Erect Guinea Flower	S	Lm	Oa
<i>Hibbertia scandens</i>	Twining Guinea Flower	V	Lm	Us Oa Sa
Elaeocarpaceae				
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	S/T	Lm	Us Oa Sa
Epacridaceae				
<i>Trochocarpa laurina</i>	Tree Heath	S/T	Lm	Us Sa
Escalloniaceae				
<i>Abrophyllum ornans</i>	Native Hydrangea	S	Lm	Us Sa
<i>Polyosma cunninghamii</i>	Featherwood	S/T	Lm	Us Sa
Euphorbiaceae				
<i>Acalypha capillipes</i>	Small-leaf Acalypha	S	Lm	Us Sa
<i>Acalypha eremorum</i>	Native Acalypha	S	Lm	Us Sa
<i>Acalypha nemorum</i>	Southern Acalypha	S	Lm	Us Sa
<i>Actephila lindleyi</i>	Actephila	S/T	Lm	Us Sa
<i>Alchornea ilicifolia</i>	Native Holly	S	Lm	Us Sa
<i>Breynia oblongifolia</i>	Native Coffee Bush	S	Lm	Us Oa Sa
<i>Cleistanthes cunninghamii</i>	Cleistanthes	S/T	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Croton phlebalioides</i>	Narrow-leaf Croton	S	Lm	Us Sa
<i>Croton verreauxii</i>	Native Cascarilla	S/T	Lm	Us Sa
<i>Macaranga tanarius</i>	Macaranga	S/T	Lm	Us
<i>Mallotus claxioides</i>	Scrub Odour Bush	S/T	Lm	Us Sa
<i>Oncolanthus nutans</i> (<i>O. populifolius</i>)	Qld Bleeding Heart	S/T	Lm	Us Sa
Eupomatiaceae				
<i>Eupomatia bennettii</i>	Small Bolwarra	S	Lm	Us Sa
<i>Eupomatia laurina</i>	Bolwarra	S	Lm	Us Sa
Escaloniaceae				
<i>Cuttisia viburnea</i> (-)	Native Elderberry	T	Lm	Us Sa
Fabaceae				
<i>Abrus precatorius</i>	Crabs Eye Vine	V	Lm	Us Oa Sa
<i>Aotus lanigera</i>	Pointed Aotis	S	Lm	Oa Sa
<i>Glycine clandestina</i>	Twining Glycine	V	Lm	Oa
<i>Glycine tomentella</i>	Woolly Glycine	V	Lm	Oa
<i>Hardenbergia violacea</i>	False Sarsparilla	V	Lm	Oa
<i>Hovea linearis</i>	Common Hovea	S	Lm	Oa
<i>Hovea longipes</i> (-)	Brush Hovea	S	Lm	Oa
<i>Indigophora australis</i>	Australian Indigo	S	Lm	Oa
<i>Kennedia rubicunda</i>	Dusky Coral Pea	V	Lm	Oa
<i>Oxylobium ilicifolium</i> (-)	Holly Pea	S	Lm	Oa
<i>Oxylobium scandens</i> (-)	Netted Shaggy Pea	S	Lm	Oa
<i>Pultenaea retusa</i>	Blunt-leaf Bush Pea	S	Lm	Oa
<i>Pultenaea spinulosa</i> (-)	Prickly Pea	S	Lm	Oa
<i>Pultenaea villosa</i> (-)	Hairy Bush Pea	S	Lm	Oa
<i>Swainsona galegifolia</i>	Darling Pea	S	Lm	Oa
Goodeniaceae				
<i>Goodenia rotundifolia</i>	Star Goodenia	H Gc	Lm	Oa
<i>Scaevola aemula</i> (-)	Fairy Fan Flower	H Gc	Lm	Oa
<i>Scaevola albida</i> (-)	Fan Flower	H	Lm	Oa
<i>Scaevola calendulacea</i> (-)	Scented Fan Flower	H Gc	Lm	Oa
<i>Scaevola ramosissima</i> (-)	A Fan Flower	H Gc	Lm	Oa
Lamiaceae				
<i>Ajuga australis</i>	Southern Bugle	H	Lm	Oa
<i>Plectranthus argentatus</i> (-)	Silver Native Coleus	H	Lm	Us Sa
<i>Plectranthus graveolens</i>	Native Coleus	H	Lm	Us Sa
<i>Plectranthus parviflorus</i>	Cockspar Flower	H	Lm	Us Sa
<i>Prostanthera ovalifolia</i>	Oval-leaf Mint Bush	S	Lm	Os Sa
Lauraceae				
<i>Cryptocarya laevigata</i>	Glossy Laurel	S/T	Lm	Us Sa
<i>Cryptocarya meisneriana</i>	Thick-leaf Laurel	S/T	Lm	Us Sa
Leeaceae				
<i>Leea indica</i> (-)	Bandicoot Berry	S	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Lythraceae				
<i>Lagerstroemia archeriana</i> (-)	Native Crepe Myrtle	S/T	Lm	Us Oa Sa De
Malvaceae				
<i>Pavonia hastata</i> (-)	Pavonia	S	Lm	Oa Sa
<i>Hibiscus heterophyllus</i>	Native Rosella	S/T	Lm	Us Sa
<i>Hibiscus geranioides</i> (-)		S	Lm	Oa
Melastomaceae				
<i>Melastoma affine</i>	Pink Lasiandra	S	Lm	Us Sa Oa
Meliaceae				
<i>Turraea pubescens</i> (<i>brownii</i>) Native Witch-Hazel		S/T	Lm	Us Sa
Menispermaceae				
<i>Pleogyne australis</i>	Pleogyne	V	Lm	Us Sa
Mimosaceae				
<i>Acacia complanata</i>	Flat-stem Wattle	S		Oa Pf
<i>Acacia hubbardiana</i>	Yellow Prickly Moses	S		Oa Pf
<i>Acacia irrorata</i>	Blue Skin	S		Oa Pf
<i>Acacia myrtifolia</i>	Myrtle Wattle	S		Oa Pf
<i>Acacia suaveolens</i>	Sweet Wattle	S		Oa Pf
<i>Acacia ulicifolia</i>	Prickly Moses	S		Oa Pf
<i>Archidendron lovelliae</i> (-)	Baconwood	S/T	Lm	Us Sa
Monimiaceae				
<i>Wilkiea huegeliana</i>	Tetra Beech	S/T	Lm	Us Sa
<i>Wilkiea macrophylla</i>	Large-leaf Wilkiea	S/T	Lm	Us Sa
Myoporaceae				
<i>Eremophila debilis</i>	Winter Apple	S Gc	Lm	Os
<i>Myoporum boninense</i> (<i>M. ellipticum</i>)	Boobialla	S Gc	Lm	Os
<i>Myoporum montanum</i>	Mountain Boobialla	S	Lm	Os
Myrsinaceae				
<i>Aegiceras corniculatum</i>	Milky Mangrove	S/T	Lm St	Oa Coastal
<i>Rapanea howittiana</i>	Scrub Muttonwood	S/T	Lm	Us Sa
<i>Rapanea subsessilis</i>	Red Muttonwood	S/T	Lm	Us Sa
Myrtaceae				
<i>Archirhodomyrtus beckleri</i> (-)	Rose Myrtle	S	Lm	Us Sa
<i>Austrorhynchus fragrantissima</i> (-)	Sweet Myrtle	T	Lm	Us Sa
<i>Austrorhynchus hillii</i>	Scaly Myrtle	S/T	Lm	Us Sa
<i>Austrorhynchus inophloia</i>	Thread-bark Myrtle	S/T	Lm	Us Sa
<i>Austrorhynchus aff. lasioclada</i> (-)	Velvet Myrtle	T	Lm	Us Sa
<i>Austrorhynchus metrosideros</i> (-)		S	Lm	Us Sa
<i>Ptilidostigma glabrum</i> (-)	Plum Myrtle	S	Lm	Us Sa
<i>Ptilidostigma rhytidisperma</i>	Small-leaf Plum Myrtle	S	Lm	Us Sa
<i>Rhodamnia acuminata</i> (-)	Cooloola Ironwood	S	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Rhodamnia dumicola</i>	Rib-fruit Malletwood	S/T	Lm	Us Sa
<i>Rhodamnia maidenii</i> (-)	Smooth Scrub Turpentine	S	Lm	Us Sa
<i>Rhodomyrtus psidioides</i>	Native Guava	S	Lm	Us Sa
<i>Syzygium wilsonii</i> (-)	Powder-puff Lilly Pilly	S	Lm	Us Sa
Nyctaginaceae				
<i>Pisonia aculeata</i>	Native Bougainvillea	V	Lm	Us Sa
Oleaceae				
<i>Jasminum simplicifolium</i>	Slender Jasmine	V	Lm	Us Sa
<i>Notelaea ovata</i>	Netted Mock Olive	S	Lm	Us Sa
<i>Notelaea venosa</i>	Veined Mock Olive	S	Lm	Us Sa
Passifloraceae				
<i>Passiflora aurantia</i>	Red Passion Flower	V	Lm	Us Oa Sa
<i>Passiflora herbertiana</i>	Yellow Passion Flower	V	Lm	Us Oa Sa
Peperoniaceae				
<i>Peperomia blanda</i> (<i>leptostachya</i>)	Native Peperomia	H	Lm	Us Sa
<i>Peperomia tetraphylla</i>	Native Peperomia	H	Lm	Us Sa
Pittosporaceae				
<i>Citriobatus linearis</i>	Black-fruit Thornbush	S	Lm	Us Sa
<i>Citriobatus paucifloris</i>	Orange Thornbush	S	Lm	Us Sa
<i>Pittosporum revolutum</i>	Brisbane Laurel	S	Lm	Us/Wb Sa/Oa
Proteaceae				
<i>Banksia oblongifolia</i>	Dwarf Banksia	S		Oa Pf
<i>Banksia robur</i>	Swamp Banksia	S		Oa Pf
<i>Grevillea leiophylla</i>	Wallum Grevillea	S		Oa Pf
<i>Grevillea 'Robyn Gordon'</i>	G. 'Robyn Gordon'	S		Oa Pf
<i>Grevillea sericea</i>	Pink Spider Flower	S		Oa Pf
<i>Grevillea 'Shirley Howie'</i>	G. 'Shirley Howie'	S		Oa Pf
<i>Grevillea 'Superb'</i>	G. 'Superb'	S		Oa Pf
<i>Hakea florulenta</i>	Hakea	S		Oa Pf
<i>Hakea purpurea</i>	Purple Hakea	S		Oa Pf
<i>Lambertia formosa</i> (-)	Mountain Devil	S		Oa Pf
<i>Lomatia silaifolia</i>	Crinkle Bush	S		Oa Pf
<i>Stenocarpus angusifolia</i> (-)		S		Oa Pf
Rhizophoraceae				
<i>Bruguiera gymnorhiza</i>	Orange Mangrove	S/T	Lm St	Oa Coastal
<i>Ceriops tagal</i>	Yellow Mangrove	S/T	Lm St	Oa Coastal
<i>Rhizophora stylosa</i>	Stilted Mangrove	S/T	Lm St	Oa Coastal
Rosaceae				
<i>Rubus parvifolia</i>	Pink Raspberry	S	Lm	Oa
<i>Rubus rosifolius</i>	Native Raspberry	S	Lm	Us Sa
Rubiaceae				
<i>Canthium coprosmaoides</i>	Coast Canthium	S/T	Lm	Us Oa Sa
<i>Canthium lamprophyllum</i>	Large-leaf Canthium	S/T	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Canthium microphyllum</i>	Small-leaf Canthium	S	Lm	Us Sa
<i>Ixora bleckleri</i>	Brown Coffeeewood	S/T	Lm	Us Sa
<i>Morinda acutifolia</i>	Veiny Morinda	V	Lm	Us Sa
<i>Morinda jasminoides</i>	Sweet Morinda	V	Lm	Us Sa
<i>Pavetta australiensis</i>	Pavetta	S	Lm	Us Sa
<i>Psychotria daphnoides</i>	Smooth Psychotria	S	Lm	Us Sa
<i>Psychotria loniceroides</i>	Hairy Psychotria	S	Lm	Us Sa
<i>Psychotria simmondsiana</i>	Small Psychotria	S	Lm	Us Sa
<i>Randia benthamiana</i>	Native Gardenia	S	Lm	Us Sa
<i>Randia chartacea</i>	Narrow-leaf Gardenia	S	Lm	Us Sa
Rutaceae				
<i>Clausena brevistyla</i> (-)	Clausena	S	Lm	Us Sa
<i>Microcitrus australasica</i> (-)	Finger Lime	S	Lm	Us Sa
<i>Murraya ovatifoliolata</i> (-)	Native Murraya	S/T	Lm	Us Sa
<i>Phebalium woombie</i> (-)	Phebalium	S	Lm	Oa
Sambucaceae				
<i>Sambucus australasica</i>	Yellow Elderberry	S	Lm	Us Sa
Sapindaceae				
<i>Alectryon coriaceous</i> (-)	Beach Bird's Eye	S/T	Lm	Wb Oa
<i>Arytera microphylla</i> (-)	Dwarf Coogara	S	Lm	Us Sa
<i>Cupaniopsis newmanii</i> (-)	Long-leaf Tuckeroo	T	Lm	Us Sa Oa
<i>Cupaniopsis serrata</i>	Rusty Tuckeroo	S/T	Lm	Us Sa Oa
<i>Cupaniopsis wadsworthii</i> (-)	Dwarf Tuckeroo	S	Lm	Us Sa
<i>Harpullia alata</i> (-)	Wing-leaf Tulip	S	Lm	Us Sa
<i>Mischocarpus undulatus</i>	Red Pear-fruit	T	Lm	Us Sa
Sapotaceae				
<i>Planchonella myrsinoides</i>	Yellow Plumwood	S/T	Lm	Us Sa
Scrophulariaceae				
<i>Artemesia fimbriatum</i>	Koala bells	H	Lm	Oa
Tetragoniaceae				
<i>Tetragonia tetragonioides</i>	Native Spinach	H Gc	St Sc	Oa
Solanaceae				
<i>Duboisia myoporoides</i>	Corkwood	S/T	Lm	Us Sa
<i>Solanum aviculare</i>	Kangaroo Apple	S	Lm	Us Sa Oa
<i>Solanum densevestitum</i> (-)	Furry Nightshade	S	Lm	Us Sa
<i>Solanum stelligerum</i> (-)	Star Nightshade	S	Lm	Us Sa
Sterculiaceae				
<i>Brachychiton bidwillii</i>	Little Kurrajong	S	Lm	Us Sa Oa
<i>Commersonia fraseri</i>	Scrub Kurrajong	S	Lm	Us Sa Oa
Symplocaceae				
<i>Symplocos baeuerlenii</i> (-)	Shrubby Hazelwood	S	Lm	Us Sa

Fire-Retardant Plants for Medium Gardens

The following plants can be used in addition to the list of plants for small gardens.

Scientific Name	Common Name	Form	Fire Retardance	Comments
MONOCOTYLEDONS				
Arecaceae				
<i>Archontophoenix cunninghamii</i>	Picabeen Palm	P	Lm	Ad
<i>Calamus muelleri</i>	Lawyer Cane Vine	P	Lm	Ad
<i>Livistona australis</i>	Cabbage Palm	P	Lm	Ad
Smilacaceae				
<i>Ripogonum fawcettianum</i>	Small Supplejack	V	Lm	Sa
<i>Smilax australis</i>	Barb-wire Vine	V	Lm	Sa Oa
DICOTYLEDONS				
Akaniaceae				
<i>Akania lucens</i>	Turnipwood	T	Lm	Us
Alangiaceae				
<i>Alangium villosum</i>	Muskwood	T	Lm	Us
<i>polyosmoides</i>	Muskwood	T	Lm	Us
<i>Alangium villosum tomentosum</i>				
Annonaceae				
<i>Polyalthia nitidissima</i>	Canary Beech	T	Lm	Us
Apocynaceae				
<i>Astonia constricta</i>	Quinine Tree	T	Lm	Us
<i>Melodinus acutiflorus</i>	Merangarra	V	Lm	Sa
<i>Melodinus australis</i>	Southern Melodinus	V	Lm	Sa
Araliaceae				
<i>Cephalalaria cephalobotrys</i>	Climbing Panax	V	Lm	Sa
Bignoniaceae				
<i>Pandorea pandorana</i>	Wonga Vine	V	Lm	Oa Sa
Caesalpinaceae				
<i>Barklya syringifolia</i>	Crown of Gold Tree	T	Lm	Us Sa Oa
<i>Cassia tomentella</i> (-)	Velvet Bean	S/T	Lm	Us Oa
Cunoniaceae				
<i>Callicoma serratifolia</i> (-)	White Alder	S/T	Lm	Us
Dilleniaceae				
<i>Tecomathe hillii</i> (-)	Fraser Island Climber	V	Lm	Sa

APPENDICES

Scientific Name	Common Name	Form	Fire Retardance	Comments
Thymeliaceae				
<i>Phaleria clerodendron</i> (-)		S	Lm	Us Sa
<i>Phaleria chernsideana</i>	Scrub Daphne	S/T	Lm	Us Sa
<i>Pimelea linifolia</i>	Slender Rice Flower	S		Oa
<i>Wikstroemia indica</i>	Tie Bush	S	Lm	Us Oa Sa
Tiliaceae				
<i>Corchorus cunninghamii</i>	Corchorus	S	Lm	Us Sa
Urticaceae				
<i>Elatostema reticulatum</i>	Rainforest Spinach	H	Lm	Us Sa
<i>Elatostema stipitatum</i> (-)	Small Soft Nettle	H	Lm	Us Sa
<i>Pipturus argenteus</i>	Native Mulberry	S/T	Lm	Us Sa
Verbenaceae				
<i>Callicarpa pedunculata</i>	Velvet-leaf	S	Lm	Us Sa
<i>Clerodendrum floribundum</i>	Lolly Bush	S/T	Lm	Us Oa Sa
<i>Clerodendrum tomentosum</i>	Hairy Lolly Bush	S/T	Lm	Us Oa Sa
<i>Phyla nodiflora</i> (-)	Condamine Couch	H Gc	Lm	Oa
<i>Vitex ovata</i> (-)	Vitex	S Gc	Lm	Oa
Violaceae				
<i>Viola betonicifolia</i>	Purple Violet	H	Lm	Us Sa
<i>Viola hederacea</i>	Native Violet	H	Lm	Us Sa
Vitaceae				
<i>Cayratia acris</i>	Hairy Water Vine	V	Lm	Us Sa
<i>Cayratia clematidea</i>	Slender Grape	V	Lm	Us Oa Sa
<i>Cayratia euryneura</i>	Soft Water Vine	V	Lm	Us Sa
<i>Cissus opaca</i>	Small-leaf Water Vine	V	Lm	Us Oa Sa
Winteraceae				
<i>Tasmaniania insipida</i>	Pepper Bush	S	Lm	Us Sa
PTERIDOPHYTES				
Aspleniaceae				
<i>Asplenium attenuatum</i>	A Spleenwort	F	Lm	Sa
<i>Asplenium australasicum</i>	Crow's Nest Fern	eF	Lm	Sa
Osmundaceae				
<i>Todea barbara</i>	King Fern	tF	Lm	Us Sa
Polypodiaceae				
<i>Drynaria rigidula</i>	Basket Fern	eF	Lm	Sa
<i>Phymatodes scandens</i>	Scented Climbing Fern	tF	Lm	Sa
<i>Platynerium bifurcatum</i>	Elkhorn	eF	Lm	Sa
<i>Platynerium superbum</i>	Staghorn	F	Lm	Sa
<i>Pyrrosia confluens</i>	Felt Fern	eF	Lm	Sa
<i>Pyrrosia rupestris</i>	Rock Felt Fern	eF	Lm	Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Ebenaceae				
<i>Diospyros australis</i>	Black Plum	T	Im	Us/Wb
<i>Diospyros geminata</i>	Scaly Ebony	T	Im	Us/Wb
<i>Diospyros mabacea</i> (-)	Red-fruited Ebony	T	Im	Us
Escalloniaceae				
<i>Anopterus macleayanus</i> (-)	Queensland Laurel	T	Im	Us
<i>Polyalthia nitidissima</i>	Canary Beech	T	Im	Us
Euphorbiaceae				
<i>Claoxylon australe</i>	Brittlewood	S/T	Im	Us
<i>Croton achrophyloides</i>	Thick-leaved Croton	S/T	Im	Us
<i>Croton insularis</i>	Queensland Cascarilla	S/T	Im	Us
<i>Croton stigmatosus</i>	White Croton	T	Im	Us
Fabaceae				
<i>Erythrina vespertilio</i>	Bat's Wing Coral Tree	T	Im	Ad De
Hernandiaceae				
<i>Hernandia bivalvis</i>	Cudgerie	T	Im	Wb
Lauraceae				
<i>Cryptocarya bidwillii</i>	Yellow Laurel	T	Im	Wb
<i>Cryptocarya meisneriana</i>	Thick-leaf Laurel	T	Im	Wb
<i>Cryptocarya sclerophylla</i>	Boonah Laurel	T	Im	Wb
<i>Cryptocarya triplinervis</i>	Brown Laurel	T	Im	Wb
<i>Cryptocarya triplinervis</i> var. <i>pubens</i>	Hairy Brown Laurel	T	Im	Wb
Meliaceae				
<i>Owenia venosa</i>	Crow's Apple	T	Im	Us/Wb
<i>Synoum glandulosum</i>	Scentless Rosewood	S/T	Im	Us
<i>Turraea pubescens</i>	Native Witch-Hazel	T	Im	Us
<i>(T. brownii)</i>				
Menispermaceae				
<i>Stephania japonica</i> var. <i>discolor</i>	Tape Vine	V	Im	Sa Oa
Mimosaceae				
<i>Acacia aulacocarpa</i>	Hickory Wattle	T	Im	Wb/Pf
<i>Acacia implexa</i>	Light Wood	T	Im	Wb/Pf
<i>Acacia melanoxylon</i>	Blackwood	T	Im	Wb/Pf
<i>Acacia cincinnata</i>	Wattle	S/T	Im	Wb/Pf
<i>Parachidendron pruinatum</i>	Snowwood	T	Im	Us/Wb
Moraceae				
<i>Ficus coronata</i>	Creek Sandpaper Fig	T	Im	Us/Wb
<i>Ficus fraseri</i>	A Sandpaper Fig	T	Im	Us/Wb
<i>Ficus opposita</i>	A Sandpaper Fig	T	Im	Us/Wb
<i>Sireblus brunonianus</i>	Whalebone Tree	T	Im	Us/Wb
<i>(S. pendulinus)</i>				

Scientific Name	Common Name	Form	Fire Retardance	Comments
Myoporaceae				
<i>Myoporum acuminatum</i>	Coast Boobialla	S/T	Im	Wb Oa
Myrsinaceae				
<i>Rapanea variabilis</i>	Muttonwood	T	Im	Us
Myrtaceae				
<i>Acmena smithii</i>	Creek Lilly Pilly	T	Im	Us/Wb
<i>(small varieties)</i>	Silky Myrtle	S/T	Im	Us
<i>Decaspermum humile</i>	Metrosideros <i>queenlandica</i> (-)	T	Im	Us
<i>Rhodamnia rubescens</i>	Brown Malletwood	T	Im	Us/Wb
<i>Syzygium hodgkinsonia</i> (-)	Smooth-bark Rose Apple	T	Im	Us
Oleaceae				
<i>Notelaea johnsonii</i>	Veinless Mock Olive	S/T	Im	Us
<i>Notelaea longifolia</i>	Large Mock Olive	S/T	Im	Us/Wb
<i>Notelaea microcarpa</i>	Velvet Mock Olive	S/T	Im	Us/Wb
Pittosporaceae				
<i>Hymenosporum flavum</i>	Native Frangipani	T	Im	Us Ad
<i>Pittosporum undulatum</i>	Mock Orange	T	Im	Us/Wb
Proteaceae				
<i>Buckinghamia celsissima</i> (-)	Ivory Curl Flower	T	Im	Wb
<i>Grevillea helmsiae</i> (-)		T	Im	Us Pf
<i>Hicksbeachia pinnatifolia</i> (-)	Red Boppel Nut	T	Im	Us Ad Pf
<i>Lomatia arborescens</i> (-)	Tree Lomatia	S/T	Im	Us Pf
<i>Macadamia integrifolia</i>	Queensland Nut	T	Im	Wb
<i>Macadamia ternifolia</i>	Maroochy Nut	T	Im	Wb
<i>Macadamia tetraphylla</i>	Rough Shell Bush Nut	T	Im	Wb
<i>Triunia youngiana</i>	Spice Bush	T	Im	Us
Rubiaceae				
<i>Coelospermum paniculatum</i>	Coelospermum	V	Im	Sa
<i>Hodgkinsonia ovatiflora</i>	Golden Ash	T	Im	Us/Wb
Rununculaceae				
<i>Clematis glycinoides</i>	Headache Vine	V	Im	Sa
Rutaceae				
<i>Acronychia imperforata</i>	Coast Aspen	S/T	Im	Us/Wb
<i>Acronychia pauciflora</i>	Soft Acronychia	S/T	Im	Us
<i>Microcitrus australis</i>	Round Lime	S	Im	Us
Sapindaceae				
<i>Alectryon connatus</i>	Alectryon	T	Im	Wb Slow at first
<i>Alectryon subcinereus</i>	Wild Quince	T	Im	Wb
<i>Alectryon subidentatus</i>	Holly-leaf Bird's Eye	T	Im	Wb
<i>Alectryon tomentosus</i>	Hairy Bird's Eye	T	Im	Wb
<i>Arytera distylis</i>	Twin-leaf Coogera	T	Im	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Arytera divaricata</i>	Rose Tamarind	T	Lm	Wb
<i>Arytera foveolata</i>	Pitted Coogera	T	Lm	Wb
<i>Cupaniopsis parvifolia</i>	Small-leaf Tuckeroo	T	Lm	Wb
<i>Cupaniopsis shirleyana</i> (-)	Wedge-leaf Tuckeroo	T	Lm	Us/Wb
<i>Cupaniopsis tomentella</i> (-)	Boonah Tuckeroo	T	Lm	Wb
<i>Elattostachys nervosa</i>	Beetroot	T	Lm	Us/Wb
<i>Elattostachys xylocarpa</i>	White Tamarind	T	Lm	Wb
<i>Guioa semiglauc</i>	Wild Quince	T	Lm	Wb
<i>Lepiderema pulchella</i> (-)	Fine-leaf Tuckeroo	T	Lm	Wb
<i>Mischocarpus australis</i>	Red Pear-fruit	T	Lm	Wb
<i>Toechima tenax</i>	Scrub Teak	T	Lm	Wb
Sapotaceae				
<i>Planchonella chartacea</i>	Thin-leaf Plum	S/T	Lm	Us Sa
<i>Planchonella cotinifolia</i>	Small-leaf Plum	S/T	Lm	Us Sa
Simaroubaceae				
<i>Guilfoylia monostylis</i>	Native Plum	T	Lm	Us
Symplocaceae				
<i>Symplocos thwaitesii</i>	Buff Hazelwood	S/T	Lm	Us
PTERIDOPHYTES				
Cyatheaceae				
<i>Cyathea australis</i>	Rough Tree Fern	tF	Lm	Us
<i>Cyathea cooperi</i>	Common Tree Fern	tF	Lm	Us
<i>Cyathea leichhardtiana</i>	Prickly Tree Fern	tF	Lm	Us

Fire-Retardant Plants for Large Gardens, Acreage Blocks, Parks and Farms

The following plants can be used in addition to the lists of plants for small and medium gardens.

Scientific Name	Common Name	Form	Fire Retardance	Comments
GYMNOSPERMS				
Araucariaceae				
<i>Agathis robusta</i> (-)	Old Kauri	T	Lm	Pf - resin
<i>Araucaria bidwillii</i> (-)	Bunya Pine	T	Lm	Pf - resin
<i>Araucaria cunninghamii</i>	Hoop Pine	T	Lm	Pf - resin
Podocarpaceae				
<i>Podocarpus elatus</i>	Brown or Plum Pine	T	Lm	Pf - resin
MONOCOTYLEDONS				
Araceae (Palmae)				
<i>Calamus muelleri</i>	Lawyer Cane Vine	V	Lm	Sa Oa

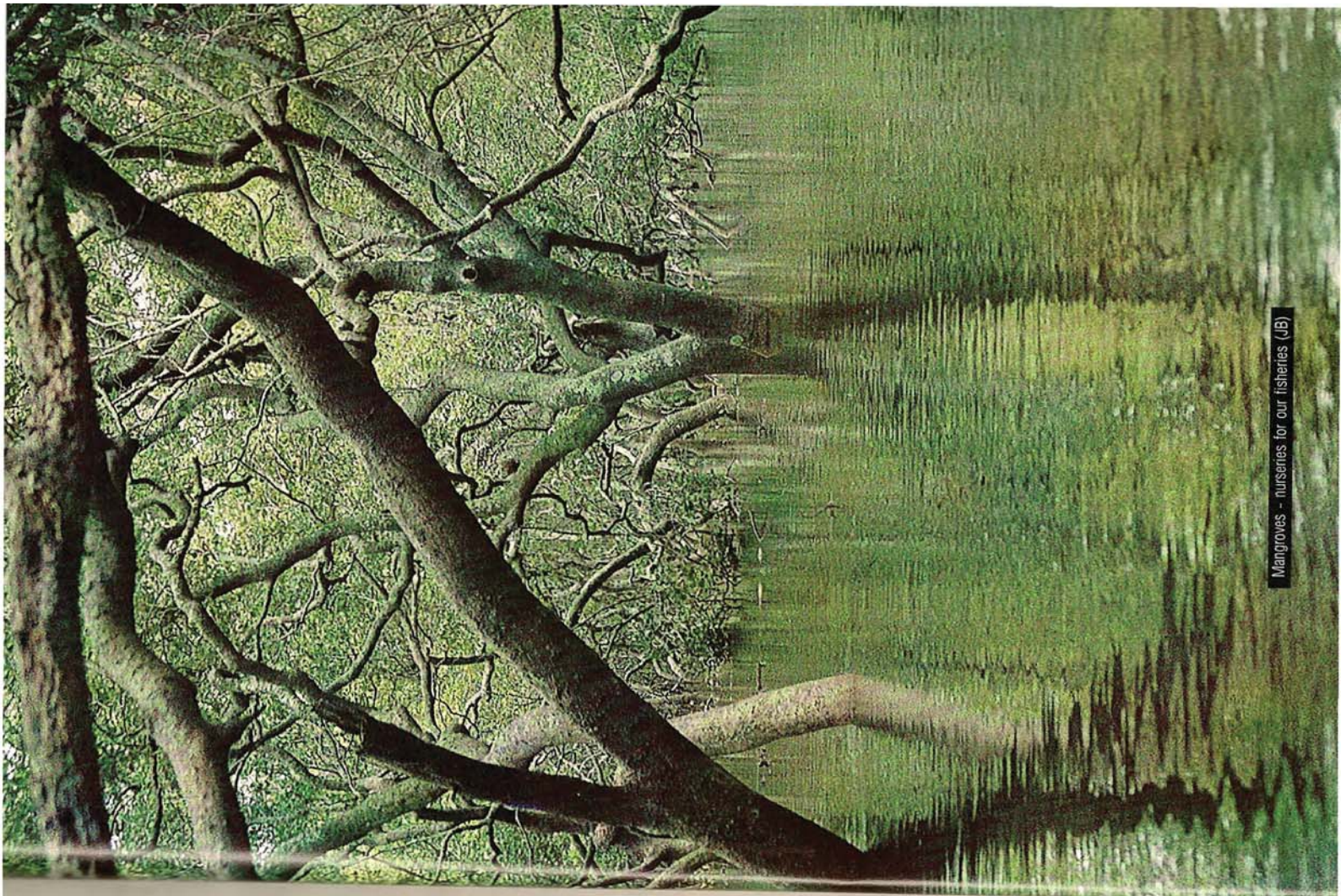
Scientific Name	Common Name	Form	Fire Retardance	Comments
Flagellariaceae				
<i>Flagellaria indica</i>	Supplejack	V	Lm	Sa
Pandanaceae				
<i>Freylinetia excelsa</i>	Climbing Pandanus	V	Lm	Sa
<i>Freylinetia scandens</i>	Climbing Pandanus	V	Lm	Sa
Smilacaceae				
<i>Ripogonum album</i>	White Supplejack	V	Lm	Sa
<i>Ripogonum brevifolium</i>	Supplejack	V	Lm	Sa
<i>Ripogonum discolor</i>	Prickly Supplejack	V	Lm	Sa
<i>Ripogonum elseyanum</i>	Hairy Supplejack	V	Lm	Sa
DICOTYLEDONS				
Anacardiaceae				
<i>Euroschinus falcata</i>	Ribbonwood	T	Lm	Wb
<i>Rhodospaera rhodanthema</i>	Deep Yellowwood	T	Lm	Wb
Annonaceae				
<i>Melodorum leichhardtii</i> (Rauvenhoffia L.)	Zig-Zag Vine	V	Lm	Sa
Apocynaceae				
<i>Alstonia constricta</i>	Quinine Tree	T	Lm	Wb
<i>Melodinus acutiflorus</i>	Merangarra	V	Lm	Sa
<i>Melodinus australis</i>	Southern Melodinus	V	Lm	Sa
<i>Parsonsia eucalyptophylla</i>	Gargaloo	V	Lm	Sa Oa
<i>Parsonsia fulva</i>	Furry Silkpod	V	Lm	Sa
<i>Parsonsia lanceolata</i>	Northern Silkpod	V	Lm	Sa
<i>Parsonsia latifolia</i>	Monkey Vine	V	Lm	Sa
<i>Parsonsia straminea</i>	Monkey Rope	V	Lm	Sa Oa
<i>Parsonsia velutina</i>	Velvet Silkpod	V	Lm	Sa Oa
<i>Parsonsia ventricosa</i>	Pointed Silkpod	V	Lm	Sa
Araceae				
<i>Calamus muelleri</i>	Lawyer Cane	V	Lm	Sa
Araliaceae				
<i>Cephalalaria cephalobotrys</i>	Climbing Panax	V	Lm	Sa
<i>Polyscias elegans</i>	Celerywood	T	Lm	Wb/Ad Oa
<i>Polyscias murrayi</i>	Pencil Cedar	T	Lm	Sa
Asclepiadaceae				
<i>Marsdenia rostrata</i>	Common Milk Vine	V	Lm	Ad Oa Sa
Atherospermataceae				
<i>Daphnandra micrantha</i>	Socketwood	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
Avicenniaceae				
<i>Avicennia marina</i>	Grey Mangrove	T	Lm St	Oa Coastal
Burseraceae				
<i>Canarium australasicum</i>	Carrotwood	T	Lm	Wb
Caesalpinhiaceae				
<i>Cassia marksiana</i> (-)	Native Laburnum	T	Lm	Wb
<i>Caesalpinia bonduc</i>	Caesalpinia	V	Lm	Sa
<i>Caesalpinia scortechinii</i>	Large Prickle Vine	V	Lm	Sa
<i>Caesalpinia subtiropica</i>	Corky Prickle Vine	V	Lm	Sa
Celastraceae				
<i>Celastrus australis</i>	Staff Climber	V	Lm	Sa
<i>Celastrus subspicatus</i>	Large Staff Vine	V	Lm	Sa
<i>Loxeniella barbata</i> (<i>Hippocratea</i> b.)	Knot Vine	V	Lm	Sa
Cunoniaceae				
<i>Caldcluvia paniculosa</i>	Rose-leaf Marara	T	Lm	Wb
<i>Ceratopetalum apetalum</i> (-)	Coachwood	T	Lm	Wb
<i>Grissoia benthamii</i>	Red Carabeen	T	Lm	Wb
<i>Pseudoweinmannia</i>				
<i>lachnocarpa</i>	Marara	T	Lm	Wb
<i>Schizomeria ovata</i>	White Birch	T	Lm	Us/Wb
Ebenaceae				
<i>Diospyros fasciculosa</i>	Grey Ebony	T	Lm	Wb
<i>Diospyros pentamera</i>	Myrtle Ebony	T	Lm	Wb
Ehretiaceae				
<i>Cordia dichotoma</i> (-)	Cordia	T	Lm	Wb
<i>Ehretia acuminata</i>	Koda	T	Lm	Ad De
Elaeocarpaceae				
<i>Elaeocarpus eumundi</i>	Eumundi Quandong	T	Lm	Wb
<i>Elaeocarpus grandis</i>	Blue Quandong	T	Lm	Wb
<i>Elaeocarpus kirtonii</i>	White Quandong	T	Lm	Wb
<i>Elaeocarpus obovatus</i>	Hard Quandong	T	Lm	Wb
<i>Sloanea australis</i>	Maiden's Blush	T	Lm	Wb
<i>Sloanea woollii</i>	Yellow Carabeen	T	Lm	Wb
Escalloniaceae				
<i>Quintinia verdonii</i>	Grey Possumwood	T	Lm	Wb
Euphorbiaceae				
<i>Austrobauxia swainii</i> (-)	Pink Cherry	T	Lm	Wb
<i>Baloghia inophylla</i> (<i>B. lucida</i>)	Scrub Bloodwood	T	Lm	Wb
<i>Bridelia exaltata</i>	Scrub Ironbark	T	Lm	Wb
<i>Bridelia leichhardtii</i>	Leichhardt's Ironbark	T	Lm	Wb
<i>Claoxylon australe</i>	Brittlewood	T	Lm	Wb
Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Dissiliaria baloghoides</i>	Lancewood	T	Lm	Wb
<i>Drypetes australasica</i>	Yellow Tulip	T	Lm	Wb
<i>Excoecaria agallocha</i>	Milky Mangrove	T	Lm St	Ad Coastal
<i>Excoecaria dallachyana</i>	Scrub Poison Tree	T	Lm	Wb
<i>Glochidion ferdinandi</i>	Cheese Tree	T	Lm	Wb
<i>Glochidion sumatranum</i>	Buttonwood	T	Lm	Wb
<i>Mallotus discolor</i>	Yellow Kamala	T	Lm	Wb
<i>Mallotus philippensis</i>	Red Kamala	T	Lm	Wb
Fabaceae				
<i>Austrosteenisia blackii</i>	Blood Vine	V	Lm	Sa Oa
<i>Castanospermum australe</i>	Black Bean	T	Lm	Wb
<i>Derris involuta</i>	Native Derris	V	Lm	Sa
<i>Erythrina</i> sp. <i>Lacey's Creek</i>	Corkwood	T	Lm	Ad De
<i>Erythrina vespertilio</i>	Batswing Coral Tree	T	Lm	Ad De
<i>Mucuna gigantea</i>	Burny Bean	V	Lm	Sa
Flacourtiaceae				
<i>Scolopia braunii</i>	Flintwood	T	Lm	Wb
Flindersiaceae				
<i>Flindersia australis</i>	Crows Ash	T	Lm	Wb
<i>Flindersia bennettiana</i>	Bennett's Ash	T	Lm	Wb
<i>Flindersia collina</i>	Leopard Ash	T	Lm	Wb
<i>Flindersia schottiana</i>	Cudgerie or Bumpy Ash	T	Lm	Wb
<i>Flindersia xanthoxyla</i>	Yellowwood	T	Lm	Wb
Icacinaceae				
<i>Citronella moorei</i>	Churnwood	T	Lm	Wb
<i>Pennantia cunninghamii</i>	Brown Beech	T	Lm	Wb
Lauraceae				
<i>Cryptocarya erythroxylon</i>	Pigeonberry Ash	T	Lm	Wb
<i>Cryptocarya hypsopodia</i>	Rib-fruit Pepperberry	T	Lm	Wb
<i>Cryptocarya macdonaldii</i>	Cooloola Laurel	T	Lm	Wb
<i>Cryptocarya microneura</i>	Murrogun	T	Lm	Wb
<i>Cryptocarya obovata</i>	Pepperberry Tree	T	Lm	Wb
<i>Endiandra muelleri</i>	Mueller's Walnut	T	Lm	Wb
<i>Endiandra pubens</i>	Hairy Walnut	T	Lm	Wb
<i>Endiandra sieberi</i> (-)	Hard Corkwood	T	Lm	Wb
<i>Neolitsea australiensis</i>	Grey Bolly Gum	T	Lm	Wb
<i>Neolitsea dealbata</i>	White Bolly Gum	T	Lm	Us/Wb
Malvaceae				
<i>Hibiscus tiliaceus</i>	Cotton Tree	T	Lm	Wb
<i>Lagunaria patersonii</i> (-)	Norfolk Is Hibiscus	T	Lm	Wb
Meliaceae				
<i>Anthocarpus nitidula</i> (<i>Pseudocarpus nitidula</i>)	Incense Cedar	T	Lm	Wb
<i>Dysoxylum fraserianum</i>	Rosewood	T	Lm	Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Dysoxylum mollissimum</i> <i>ssp. molle</i> (D. muelleri)	Red Bean	T	Lm	Wb
<i>Dysoxylum rufum</i>	Hairy Rosewood	T	Lm	Wb
<i>Melia azedarach</i>	White Cedar	T	Lm	Wb/Ad De
<i>Owenia cepiodora</i>	Onion Cedar	T	Lm	Wb
<i>Toona australis</i>	Red Cedar	T	Lm	Wb/Ad De
Menispermaceae				
<i>Legnephora moorei</i>	Wild Grape	V	Lm	Sa
<i>Sarcopetalum harveyanum</i>	Pearl Vine	V	Lm	Sa
<i>Stephania aculeata</i>	Prickly Snake Vine	V	Lm	Sa
<i>Tinospora smilacina</i>	Snake Vine	V	Lm	Sa
<i>Tinospora tinisporoides</i>	Arrow-head Vine	V	Lm	Sa
Mimosaceae				
<i>Acacia aulacocarpa</i> var. <i>aulacocarpa</i>	Hickory Wattle	T	Lm	Wb Pf
<i>Acacia bakeri</i>	Marblewood	T	Lm	Wb Pf
<i>Acacia harpophylla</i> (-)	Brigalow Wattle	T	Lm	Wb
<i>Acacia melanoxylon</i>	Blackwood	T	Lm	Wb Pf
<i>Archidendron grandiflorum</i>	Lace Flower	T	Lm	Wb
Monimiaceae				
<i>Palmeria scandens</i>	Anchor Vine	V	Lm	Sa
Moraceae				
<i>Ficus macrophylla</i>	Moreton Bay Fig	T	Lm	Wb
<i>Ficus obliqua</i>	Small-leaved Fig	T	Lm	Wb
<i>Ficus platypoda</i>	Rock Fig	T	Lm	Wb
<i>Ficus superba</i> var. <i>henniana</i>	Deciduous Fig	T	Lm	Ad De
<i>Ficus virens</i> var. <i>sublaeolata</i>	White Fig	T	Lm	Wb
<i>Ficus watkinsiana</i>	Nipple Fig	T	Lm	Wb
<i>MacLura cochinchinensis</i> (<i>Cudrania</i> c.)	Cockspur Thorn	V	Lm	Oa Sa
<i>Malaisia scandens</i>	Burny Vine	V	Lm	Sa
Myrtaceae				
<i>Acmena hemilampira</i>	Blush Satinash	V	Lm	Wb
<i>Acmena ingens</i> (<i>A. brachyandra</i>)	Red Apple	V	Lm	Wb
<i>Acmena smithii</i>	Creek Lilly Pilly	T	Lm	Wb
<i>Lophostemon confertus</i>	Brush Box	T	Lm	Wb
<i>Syncarpia glomulifera</i>	Turpentine	T	Lm	Wb
<i>Syzygium australe</i>	Scrub Cherry	T	Lm	Wb
<i>Syzygium corynanthum</i>	Sour cherry	T	Lm	Wb
<i>Syzygium crebrinerve</i>	Purple Cherry	T	Lm	Wb
<i>Syzygium moorei</i> (-)	Durobby	T	Lm	Wb
Nyctaginaceae				
<i>Pisonia aculeata</i>	Native Bougainvillea	V	Lm	Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
Oleaceae				
<i>Olea paniculata</i>	Native Olive	T	Lm	Wb
Piperaceae				
<i>Piper novae-hollandiae</i>	Native Pepper Vine	V	Lm	Sa
Pittosporaceae				
<i>Pittosporum rhombifolium</i>	Hollywood	T	Lm	Wb
Proteaceae				
<i>Floydia praedalta</i>	Ball Nut	T	Lm	Wb
<i>Grevillea hillebrandii</i> (-)	Hill's Silky Oak	T	Lm	Pf
<i>Grevillea robusta</i>	Silky Oak	T	Lm	Pf
<i>Helicia glabriflora</i>	Smooth Helicia	T	Lm	Pf
<i>Macadamia integrifolia</i>	Queensland Nut	T	Lm	Wb
<i>Macadamia ternifolia</i>	Maroochy Nut	T	Lm	Wb
<i>Macadamia tetraphylla</i> (-)	Rough-shell Bush Nut	T	Lm	Wb
<i>Oriocallis pinnata</i> (-)	Pink Silky Oak	T	Lm	Pf
<i>Oriocallis wickhamii</i> (-)	Satin Oak	T	Lm	Pf
(<i>Alloxylon flammeum</i>)				
<i>Stenocarpus salignus</i> (-)	Scrub Beefwood	T	Lm	Pf
<i>Stenocarpus sinuatus</i>	Wheel of Fire Tree	T	Lm	Wb
Ranunculaceae				
<i>Clematis aristata</i>	Old Man's Beard	V	Lm	Sa
Rhamnaceae				
<i>Alphitonia excelsa</i>	Red Ash	T	Lm	Wb
<i>Alphitonia petrei</i>	Pink Ash	T	Lm	Wb
<i>Emmenosperma alphitonioides</i>	Yellow Ash	T	Lm	Wb
Rosaceae				
<i>Rubus moluccanus</i>	Molucca Bramble	V	Lm	Sa
Rutaceae				
<i>Acronychia oblongifolia</i>	White Lilly Pilly	S/T	Lm	Wb
<i>Acronychia suberosa</i>	Corky Acronychia	T	Lm	Wb
<i>Sarcomelicope simplicifolia</i>	Bauerella	T	Lm	Wb
Sapindaceae				
<i>Alectryon reticulatus</i>	Alectryon	T	Lm	Wb
<i>Arytera lauterana</i>	Corduroy Tamarind	T	Lm	Wb
<i>Atalaya multiflora</i>	Broad-leaf Whitewood	T	Lm	Wb
<i>Atalaya salicifolia</i> (A. virens)	Scrub Whitewood	T	Lm	Wb
<i>Castanospora aphanandi</i> (-)	Brown Tamarind	T	Lm	Wb
<i>Cupaniopsis anacardioides</i>	Tuckeroo	T	Lm	Wb
<i>Cupaniopsis flagelliformis</i> (-)	Brown Tuckeroo	S/T	Lm	Wb
<i>Diploglottis campbellii</i> (-)	Small-leaf Tamarind	T	Lm	Wb
<i>Diploglottis cunninghamii</i>	Native Tamarind	T	Lm	Wb/Ad
<i>Harpullia hillebrandii</i>	Blunt-leaf Tulip	T	Lm	Wb
<i>Harpullia pendula</i>	Tulipwood	T	Lm	Wb

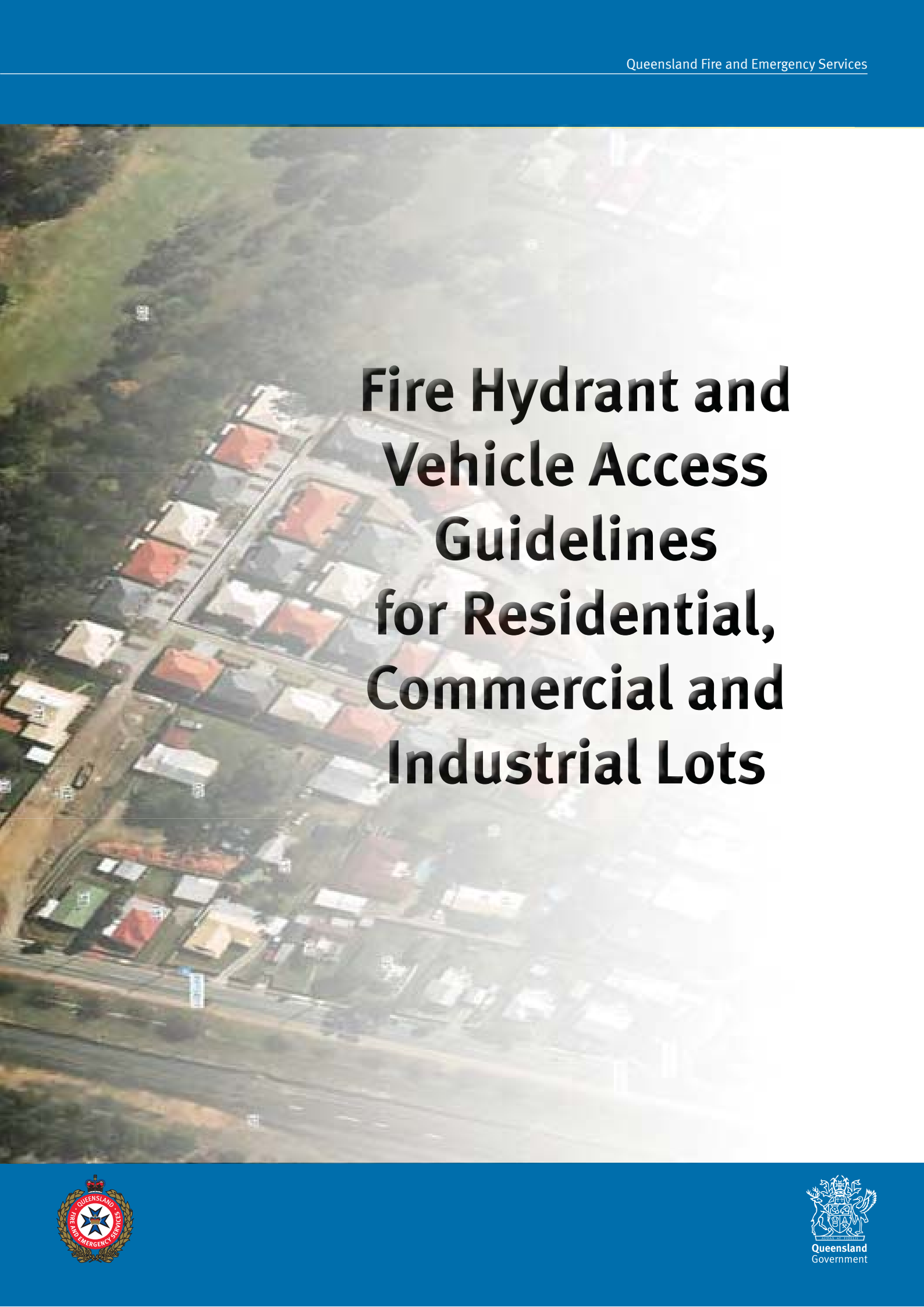
Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Jagera pseudorhus</i>	Foam Bark Tree	T	Im	Wb
<i>Mischocarpus anodontus</i>	Viny Pear-fruit	T	Im	Wb
<i>Mischocarpus pyriformis</i>	Yellow Pear-fruit	T	Im	Wb
<i>Rhyetoechia bifoliolata</i> (-)	Twin-leaf Tuckeroo	T	Im	Wb
<i>Sarcopteryx stipitata</i>	Corduroy	T	Im	Wb
<i>Toechima dasyrrhache</i>	Blunt-leaf Steelwood	T	Im	Wb
Sapotaceae				
<i>Amorphaespermum anillogum</i>	Brown Pearwood	T	Im	Wb
<i>Amorphaespermum whitei</i> (-)	Rusty Plum	T	Im	Wb
<i>Planchonella australis</i>	Black Apple	T	Im	Wb
<i>Planchonella laurifolia</i> (-)	Blush Coondoo	T	Im	Wb
<i>Planchonella pohlmaniana</i>	Yellow Boxwood	T	Im	Wb
Simaroubaceae				
<i>Ailanthus triphysa</i>	White Siris	T	Im	Wb
<i>Gutifolia monostylis</i>	Native Plum	T	Im	Wb
Siphonodontaceae				
<i>Siphonodon australis</i>	Ivorywood	T	Im	Wb
Sterculiaceae				
<i>Argyrodendron actinophyllum</i>	Black Booyong	T	Im	Wb
<i>Argyrodendron trifoliolatum</i>	Brown Tulip Oak	T	Im	Wb
<i>Brachychiton acerifolius</i>	Flame Tree	T	Im	Ad De
<i>Brachychiton discolor</i>	Lace Bark	T	Im	Ad De
<i>Brachychiton populneus</i>	Kurrajong	T	Im	Wb
<i>Brachychiton rupestris</i> (-)	Old Bottle tree	T	Im	Ad De
<i>Brachychiton</i> sp. (-)	Ormeau Bottle tree	T	Im	Ad De
<i>Commersonia bartramia</i>	Brown Kurrajong	T	Im	Us/Wb
<i>Sterculia quadrifida</i>	Peanut Tree	T	Im	Ad De
Symplocaceae				
<i>Symplocos stawelli</i>	White Hazelwood	T	Im	Wb
Ulmaceae				
<i>Aphananthe philippinensis</i>	Native Elm	T	Im	Wb
<i>Celtis paniculata</i>	Investigator Tree	T	Im	Wb
Urticaceae				
<i>Dendrocnide excelsa</i>	Giant Stinging Tree	T	Im	Wb
<i>Dendrocnide photinophylla</i>	Mulberry Stinger	T	Im	Wb
Verbenaceae				
<i>Gmelina leichhardtii</i>	White Beech	T	Im	Wb
<i>Premna lignum-vitae</i>	Lignum-vitae	T	Im	Wb
Vitaceae				
<i>Cissus antarctica</i>	Kangaroo Vine	V	Im	Wb
<i>Cissus hypoglauca</i>	Five-leaf Watervine	V	Im	Wb
<i>Cissus sterculiifolia</i>	Long-leaf Watervine	V	Im	Wb
<i>Tetrastigma nitens</i>	Shining Grape	V	Im	Wb



Appendix 2

Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots

Source: Queensland Fire and Emergency Services (2015)



Fire Hydrant and Vehicle Access Guidelines for Residential, Commercial and Industrial Lots



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Glossary of Terms

In this document, the terms are limited to the meanings described below.

Building:	A building is a fixed structure that is wholly or partly enclosed by walls or is roofed.
Structure:	For this document refer to definition of a Building.
Fire Appliance:	A vehicle used to combat a fire. A typical fire appliance (a pumper) is approximately 2.5m wide, 7.7m long and it is typically used in urban residential areas. Further specifications of fire appliances and larger appliances are available from the QFES if design solutions are required for specific situations.
Hydrant:	An assembly installed on a branch from a water pipeline, which provides a valved outlet to permit a supply of water to be taken from the pipeline for fire fighting. These include above and below ground hydrants.
QFES:	Queensland Fire and Emergency Services.
Material Change of Use:	As per the <i>Sustainable Planning Act 2009</i>
Reconfiguration of a Lot:	As per the <i>Sustainable Planning Act 2009</i>
Reticulated Water Supply:	Is a permanent infrastructure provided to deliver treated water to lots from an Urban Utility Authority through a system of pipes, mains, control valves etc. for household or industrial use. It will supply uninterrupted water at a positive pressure for fire fighting purposes.
Road or Carriageway:	Construction which is specifically designed for all vehicle travel (may or may not include a sealed top surface layer).
A Constructed Road:	For the purpose of defining widths, includes the part of the road reserve set aside for traffic and also includes roll-over kerbs but does not include the remaining part of the road reserve.
Trafficable Width:	Refers to that width of the constructed road that is unimpeded by encroachments such as street furniture or landscaping, and is available for free movement of fire appliances.



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Public Safety Business Agency working in partnership with the Queensland Fire and Emergency Services.

1. Scope

For applications seeking development approval for material change of use or reconfiguring a lot for the purpose of building, where streets and common access ways are proposed regardless of building classification.

Where reticulated hydrant systems and vehicle access are not currently required under the *Sustainable Planning Act 2009* (SPA), the *Building Act 1975* or Building Code of Australia (BCA) the measures in this document should be adopted.

Australian Standard (AS) 2419.1 2005 Appendix B is a minimum standard of design and performance for the State of Queensland. In a Local Government Authority where a local Water Authority specifies a design and performance criteria above the requirements of AS 2419.1 2005 Appendix B, the Local Water Authority requirements will be adopted.

For the installed reticulated hydrant systems the minimum water flow rate and pressure is to be 10 L/S @ 200 Kpa as per AS 2419.1 2005 Table 2.2. In a Local Government Authority where a local Water Authority specifies a flow rate and pressure above the requirements of AS 2419.1 2005 Table 2.2, the Local Water Authority requirements will be adopted.

For fire appliance access, a minimum width and height clearance for roadways is required. Constructed roads must comply with Government legislation such as the "Road Planning and Design Manual".

2. Introduction

The Queensland Fire and Emergency Services (QFES) is the primary provider of fire and rescue services throughout Queensland. The QFES is responsible for community safety, the protection of people, property and the environment from fire and chemical incidents and, in conjunction with other agencies, the rescue of people trapped in vehicles, buildings and other emergency situations.

The loss of life and property damage by fire in residential, commercial and industrial premises is a major concern to the QFES, and for this reason, these lot reconfigurations need to be designed to provide ready access for fire appliances, whilst providing a fire fighting water supply from a Hydrant System.

Water supply and access requirements for material change of use or reconfiguring a lot within this document are a planning tool and advice for building and developer applicants, it is not the intent of this document for land development applications to be referred to the QFES. They outline fire safety requirements to enable the QFES to efficiently manage fire incidents.

This document reflects Queensland Government policy of promoting sustainable development that achieves economic, social and environmental objectives, including safety. The provisions are flexible allowing planners and designers to economically achieve safety objectives without compromising aesthetics or amenity.

3. Where Do These Guidelines Apply?

These guidelines apply to all material change of use or reconfiguration of a lot that will include streets and common access ways within a common private title in areas serviced by reticulated water within Queensland, for residential buildings, both attached and detached commercial or industrial buildings that are not covered in other legislation or planning provisions.

For example, this would apply to planned townships or reconfigurations regardless of current fire service intervention.

4. Water Supply Specification

Installed reticulated hydrant systems are to be located on roadways or access ways for all material change of use and reconfigured lots for fire fighting purposes as per AS 2419.1 2005 Appendix B that provides a minimum standard for hydrant intervals. In a Local Government Authority where a Local Water Authority specifies a design and performance criteria above the requirements of AS 2419.1 2005 Appendix B, the Local Water Authority requirements will be adopted.

For the installed reticulated hydrant systems the minimum water flow rate and pressure is to be 10 L/S @ 200 Kpa as per AS 2419.1 2005 Table 2.2. In a Local Government Authority where a local Water Authority specifies a flow rate and pressure above the requirements of AS 2419.1 2005 Table 2.2, the Local Water Authority requirements will be adopted.

4.1 Hydrant Provision:

Hydrant Provision	
Expectation	Acceptable Outcomes
Where reticulated water is available, operable hydrants are to be provided.	Hydrants above or below ground should be provided and maintained to the minimum required performance standard as per AS 2419.1 2005.

Rationale:

Firefighters use water as a prime extinguishing medium for structure fires. Reticulated water mains have hydrants placed at regular intervals to enable firefighters to connect into the reticulated system. The water is pressurised by pumps in the fire appliance and delivered via hoses to the fire.

Figure 1 illustrates hydrant locations on reticulated water mains.



Figure 1 – Reticulated Hydrant System



Figure 2 – Use of Hydrant System

4.2 Hydrant Markers

Hydrant Markers	
Expectation	Acceptable Outcomes
Hydrants are suitably identified so that firefighters can locate them at all hours.	Blue cats eyes are preferred for sealed roads. Marker posts at the fence line should be used to identify hydrants where there is an unsealed road as road (HR) or path (HP) hydrants. The Figures 3-6 are examples of marker locations.

Firefighters need to quickly locate water supplies in emergencies. Hydrant indicators need to be visually identifiable from both directions by the approaching fire appliance crews and must identify the location of the hydrant.

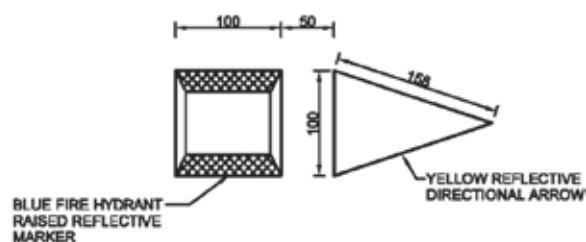


Figure 5 – Marker/directional arrow spacing detail

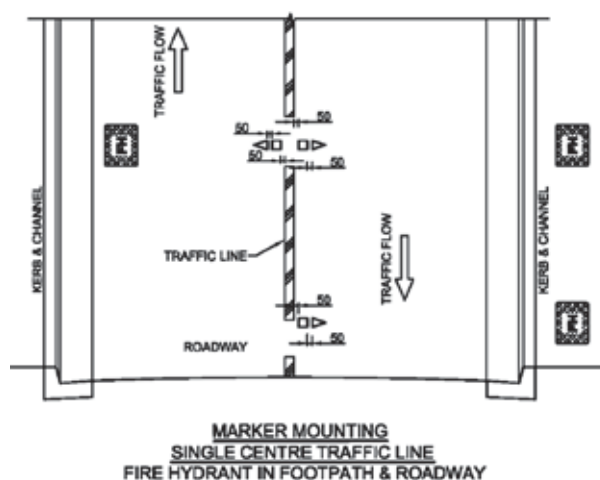


Figure 6 – Location of cats eyes on a sealed roadway

Hydrant Location	
Expectation	Acceptable Outcomes
Hydrants are located in positions that will enable firefighters to access water safely, effectively and efficiently.	Residential Streets and Accessways Above or below ground fire hydrants should be provided at not more than 120m intervals along residential streets and at each street intersection. Above ground fire hydrants may be single outlet.
	Commercial and Industrial Streets and Accessways Within streets serving commercial properties such as factories, warehouses and offices, above or below ground fire hydrants should be provided at not more than 90 m intervals and at each street intersection. Above ground fire hydrants should have dual valved outlets.

Upon arriving at a structure fire, firefighters site the fire appliance with considerations to safety, access to the fire, other responding appliances and accessible water supply for fire fighting purposes. Firefighters have an expectation that fire hydrants will be located on reticulated water systems no more than 120 metres apart as per AS 2419.1 2005, Appendix B. QFES equipment, procedures and the training of personnel is based on this preferred standard of fire hydrant placement and associated access requirements.



Note: Hydrants should be located at each intersection. With this in mind hydrant interval distances should not exceed 120 metres.

Figure 6 – Hydrant System design to minimum standards

5. Vehicle Access Requirements

Fire service vehicular access is to enable the service to intervene to fight the fire, assist with evacuation and stop the spread of fire to another building.

A minimum roadway clearance of 3.5m wide by 4.8m high is required for a fire appliance. Constructed roads must comply with Government legislation as specified in the “Road Planning and Design Manual”.

5.1 Road Width and Height

Road Width and Height	
Performance Outcomes	QFES Acceptable Outcomes
Roads are wide enough for fire appliances to gain access to a safe working area close to dwellings and water supplies whether or not on-street parking spaces are occupied.	Constructed roads must be as specified in the “Road Planning and Design Manual”.

Rationale:

Fire appliances often used in residential areas are typically 2.5 m wide and 7.7m long. The road width must allow room for safe passage of a fire appliance with additional margins for human error and safe clearances.

5.2 Road Construction

Road Construction	
Performance Outcomes	QFES Acceptable Outcomes
Roads must be constructed to facilitate the safe passage of a laden fire appliance in all weather conditions.	Roads must be constructed to a standard so that they are accessible in all weather conditions and capable of accommodating a vehicle of 15 tonnes for the trafficable road width as specified in the “Road Planning and Design Manual”.

Rationale:

Roads must be trafficable in all weather conditions. Most appliances in residential areas currently weigh less than 13 tonnes.

5.3 Road Grades

Road Grades	
Performance Outcomes	QFES Acceptable Outcomes
Grades of roads must facilitate the safe passage of fire appliances.	The average grades, dips, and exit angles must be addressed as specified in the “Road Planning and Design Manual”.

Rationale:

Steep slopes affect the free movement of appliances and hinder safe fire fighting. Severe short dips may limit access due to the overhang of the body from the wheels.

5.4 Turning Bays

Turning Bays	
Performance Outcomes	QFES Acceptable Outcomes
Provision is made for fire appliances to turn at the end of dead end roads.	Constructed roads more than 60m in length from the nearest intersection must have a turning circle with a minimum radius of 8m (including roll-over kerbs if they are provided). Other solutions using T or Y heads of specified dimensions are also appropriate. See figure 2 in the “Road Planning and Design Manual” .

Rationale:

It is dangerous for emergency vehicles to be required to reverse along roads for excessive distances in urban areas. Turning is normally carried out after the incident is under control when emergency movement is not required. Even then, large appliances reversing in residential areas create safety concerns. Fire appliances occasionally need to seek an alternative route necessitating a 180 degree turn in emergency conditions. Using a three point turn, fire appliances require a turning circle radius of 8m to turn safely. Alternative designs using specified T or Y heads are also appropriate. This area needs to be clear of obstructions.

Turning Examples

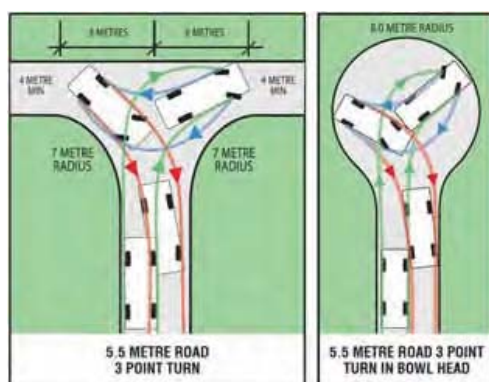


Figure 7 – Vehicle Turning Provisions

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Appendix 3

Bushfire Survival Plan Guideline / Template

Source: Queensland Fire and Emergency Services

Bushfire Survival Plan

PREPARE.ACT.SURVIVE.

Tomorrow's Queensland: strong, green, smart, healthy and fair

Department of Community Safety





You must **PREPARE** **ACT** **SURVIVE**.

Your main priority is to ensure that you and your family are safe. During a bushfire you and your family's survival and safety depend on your preparations, and the decisions you make.

The lives of you and your family are more important than any building.

Whether your plan is to leave early or stay, you must prepare your home and property to increase their level of resilience and your chances of survival.

Bushfires in Queensland

The fire season in Queensland normally commences in the far north of the state in July and progresses through to southern areas as spring approaches. The fire season can extend through to February in southern and far south-western Queensland. These time frames can vary significantly from year to year, depending on the fuel loads, long-term climate and short-term weather conditions in each area.

There are four key considerations for dealing with bushfire:

- The safety of you and your family.
- The resilience of your property.
- The protection of irreplaceable valuables and important documents.
- The maintenance of adequate levels of insurance.

This document will provide you with information about the things you need to consider to prepare yourself and your home for the bushfire season, and how to make your own personal Bushfire Survival Plan.

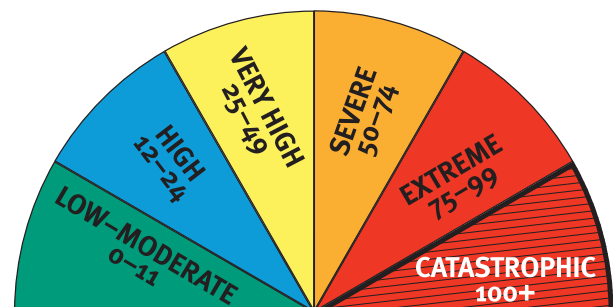
It is your responsibility
to prepare yourself, your
family and your
home for the threat
of bushfire.

Understand your risk

The first step in planning to survive a bushfire is to understand your own level of risk. By understanding your own level of risk you will be able to make informed decisions that are right for you and your family. Included with this Bushfire Survival Plan is a self-assessment tool that will enable you to assess the risk level associated with your property. If you are still unsure of your level of risk or require assistance contact your local fire station for more information. To book a Bushfire Safety presentation call 1300 369 003.

Fire danger ratings

The increased frequency of extreme bushfires in Australia in the last 10 years and the recent experience of the Black Saturday fires in Victoria have encouraged fire services throughout Australia to introduce new levels of Fire Danger Rating (FDR). A lift-out chart of the FDR system is contained within this document. Display it in a prominent place in your home or keep it with your Bushfire Survival Plan.



Catastrophic fire danger rating

The highest level is catastrophic. On a day of catastrophic FDR leaving early is the only option to ensure your survival. You must relocate early to a safer location, hours or the day before a fire occurs. Under no circumstances will it be safe to stay with your property.

Extreme fire danger rating

The second highest level is extreme. Should a fire occur in your area on a day of extreme FDR leaving early will always be the only option. Staying can only be considered for homes that:

- Have been designed and constructed specifically to address the threat of bushfire.
- Have been maintained to those levels and are currently well prepared.
- Can be actively defended by people with the skills, knowledge and confidence to implement a well-rehearsed Bushfire Survival Plan.

On days of catastrophic or extreme FDR:

- Fires are likely to be uncontrollable, unpredictable and very fast moving with highly aggressive flames extending high above tree tops and buildings.
- Thousands of embers may be violently blown into and around homes causing other fires to start rapidly and spread quickly up to 20 kilometres ahead of the main fire.
- Fire can threaten suddenly, without warning, and the heat and wind will make it difficult to see, hear and breathe as the fire approaches.
- People in the path of such fires will almost certainly be injured or die and a significant number of homes and businesses will be destroyed or damaged.
- Even well-prepared and constructed homes will not be safe.
- Expect power, water and phone networks to fail as severe winds bring down trees, power lines and blow roofs off buildings well ahead of the fire.

It is vital that you understand on these days that your survival will depend solely on how well you have prepared and how decisively you act.

Leaving late can be
a deadly option.
If you are in any doubt,
make the decision to
LEAVE EARLY.

What will you do?

At all times you need to **PREPARE.ACT.SURVIVE.**

When the fire danger rating is ‘**catastrophic**’ leaving early is the safest option.

When the fire danger rating is lower than ‘**catastrophic**’, one of the most important decisions you need to make is whether you will leave early or stay with a well prepared property. This decision is the basis of your Bushfire Survival Plan.

The following questions may help you make the right decision for whether you will leave early or stay:

- Do you need to consider family members who are young, elderly or infirm?
- Are you physically and emotionally prepared to stay with your property?
- Do you have the knowledge, skills, and confidence to stay with your property?
- Is your home adequately constructed, maintained and prepared to withstand the impact of a fire? In other words, is your home prepared to withstand the impact of a bushfire?
- Do you have well-maintained resources and equipment to fight fire, and do you know how to use them?
- Do you have appropriate protective clothing to fight a fire?
- What will you do if a rapid onset fire leaves you with no time to leave? Where will you shelter?



Leave early

If you plan to leave early then you must leave your home well before a bushfire threatens and travelling by road becomes hazardous. Your leave early preparations include:

Step 1: Preparation – your property should be well prepared for bushfire even if you intend to leave early.

Step 2: What you will do – make your Bushfire Survival Plan in accordance with your decision to leave early.

Step 3: Make a contingency plan – the FDR, the preparedness of your home, a change in household circumstances, a change in your physical preparedness or unexpected visitors are some things that may require you to reconsider your Bushfire Survival Plan.

Planning to stay

Planning is critical to successfully staying with your home may involve the risk of psychological trauma, injury or death.

Step 1: Preparation – your property must be able to withstand the impact of bushfire and well prepared to shelter you and your family.

Step 2: What you will do – make your Bushfire Survival Plan in accordance with your decision to stay.

Step 3: Make a contingency plan – the FDR, the preparedness of your home, a change in household circumstances, a change in your physical preparedness or unexpected visitors are some things that may require you to reconsider your Bushfire Survival Plan.

In making your decision to stay, here are a few things you need to consider.

- Is your property able to withstand the impact of a bushfire?
- Are you physically and emotionally prepared to stay with your property?
- Do you have well-maintained resources and equipment and do you know how to use them?
- Do you have appropriate protective clothing?
- Will your bushfire survival plan need to be different for weekdays, weekends or if someone is sick at home?
- Do you have a contingency plan?

Preparing your Bushfire Survival Plan

Preparation is the key to survival. Being involved in a fire will be one of the most traumatic experiences of your life.

- Prepare yourself – you need to be both mentally and physically prepared to carry out your Bushfire Survival Plan.
- Prepare your Bushfire Survival Plan.
- Prepare your Bushfire Survival Kit.
- Prepare your Bushfire Relocation Kit.
- Prepare your property.

When writing your plan you need to consider:

- Have you made the right choice: to leave early or stay?
- Have you discussed your choice with your family, friends and neighbours?
- Who will take charge and lead other family members by carefully communicating the various tasks set out in the plan?
- If you have chosen to stay what will you do to protect your property when the fire arrives?
- What will you put in your Bushfire Survival Kit and where will you store it?
- Do your friends, family and neighbours know the details of your plan?

- What will you do if your Bushfire Survival Plan fails?
- Do you have an alternative option or contingency plan if your plan fails?
- Do you have a Neighbourhood Safer Place (NSP) you can go to as a last resort? For more information on NSPs see www.ruralfire.qld.gov.au.
- Is it safe to travel there?

If your decision is to leave early, you must include the following information or action items in your Bushfire Survival Plan:

- Monitor media outlets – radio, TV, mobile phone and internet for bushfire alerts.
- When will you leave?
- What will be your trigger for action?
- Will your plan be different for weekdays, weekends, or if someone is at home sick or injured?
- What will you take with you (Relocation Kit)?
- Where will you and your family go when you leave early?
- What route will you take to get there?
- What will you do with your pets?
- What will you do if there are consecutive or multiple **'catastrophic'** or extreme fire danger days?
- Will you go into work on days when the FDR is in the upper levels?
- Will you send your children to school when the FDR is in the upper levels?
- Will all members of your household leave early?
- What will you do to prepare your property?
- What is your contingency plan in the event that it is unsafe to leave?

If your decision is to stay you must include the following information or actions items in your Bushfire Survival Plan:

- Monitor media outlets – Radio, TV, mobile phone and internet.
- Locate your Bushfire Survival Kit.
- Put on protective clothing.
- Remain hydrated by drinking lots of water.

- Move any stock to fully grazed paddocks.
- Move cars to a safe location.
- Remove garden furniture, doormats and other items.
- Close windows and doors and shut blinds.
- Take down curtains and move furniture away from windows.
- Seal gaps under doors and window screens with wet towels.
- Place pets inside, restrain them, and provide water.
- Block downpipes and fill gutters with water.
- Wet down the sides of buildings facing the approaching fire front.
- Wet down decks and verandas.
- Wet down fine fuels close to buildings.
- Turn on sprinklers in garden before bushfire arrives.
- Fill containers with water; bath, sinks, buckets, wheelie bins, etc.
- Have ladders ready for roof space access (inside) and against roof (outside).
- Have generator or petrol pump ready.
- Start checking and patrolling for embers outside.

When the fire front arrives:

- Take all fire fighting equipment inside such as hoses and pumps as they may melt during the fire.
- Go inside and shelter away from the fire front.
- Patrol the inside of your home, including the ceiling space, for embers or small fires that may start.
- Drink lots of water.
- Check family and pets.

After the fire front has passed:

- Wear protective equipment.
- Go outside once it is safe.
- Check for small spot fires and burning embers:
 - inside roof space
 - under floor boards
 - under house space
 - on veranda and decks

- on window ledges and door sills
- in roof lines and gutters
- garden beds and mulch
- wood heaps
- outdoor furniture
- sheds and carports
- Continue to drink lots of water.
- Stay at your property until the surrounding area is clear of fire.
- Monitor media outlets – radio, TV, mobile phone and internet.

You need to be both mentally and physically prepared to carry out your Bushfire Survival Plan

There may be other actions to include, depending on your individual property and the level of bushfire risk you are exposed to.

Include the whole family in creating your Bushfire Survival Plan. You and your family should be aware of the actions you will take at the various FDR levels and it is important to ensure this is incorporated into your Bushfire Survival Plan. The FDR for your area can be found on roadside signs and by visiting www.ruralfire.qld.gov.au and following the FDR link.

It is important that your Bushfire Survival Plan does not rely solely on receiving an alert.

Once you have completed your Bushfire Survival Plan, practise it regularly to ensure everyone involved knows exactly what to do in the event of a fire.

Preparing your Bushfire Survival Kit

It is essential that you have a Bushfire Survival Kit if your choice is to stay with your property. This kit will ensure you and your family have the important equipment you need to stay. For a comprehensive list of equipment needed in a Bushfire Survival Kit see page 14.

Preparing your Bushfire Relocation Kit

It is equally important to have a relocation kit if your choice is to leave early. This kit will ensure you and your family have important items and equipment required to relocate for the time needed. For a comprehensive list of items and equipment needed in a Bushfire Relocation Kit see page 15.

Making a contingency plan

No matter whether your decision is to leave early, well before a bush fire threatens or to stay you should still have a contingency plan as part of your Bushfire Survival Plan. There are many scenarios to consider, such as what you will do if a rapid onset fire starts in your local area making roads impassable or travel particularly dangerous. You should have other options if road travel is not safe.

- Is your house well prepared?
- Can it provide you with protection from radiant heat?
- Have you identified a safer location such as an NSP?

Sheltering in a well-prepared property is far safer than being out in the open or in a vehicle

Preparing your property

An unprepared property is not only at risk itself, but may also present an increased danger for your neighbours and their homes.

Planning is absolutely critical to safely staying with your home. Staying home involves the risk of psychological trauma, injury and death.

There are a number of measures you can take to prepare your home and property for bushfire. These include several preparations you must take annually prior to the bushfire season.

Your pre-season property preparations should include:

- Displaying a prominent house number.
- Ensuring there is adequate access for fire trucks to your property – 4 metres wide by 4 metres high with a turn-around area. Reduce vegetation loads along the access path.
- Mowing your grass regularly.
- Removing excess ground fuels and combustible material (long dry grass, dead leaves and branches).
- Clearing of leaves, twigs, bark and other debris from the roof and gutters.
- Purchasing and testing the effectiveness of gutter plugs.
- Trimming low-lying branches 2 metres from the ground surrounding your home.
- Enclosing open areas under your decks and floors.
- Installing fine steel wire mesh screens on all windows, doors, vents and weep holes.
- Pointing LPG cylinder relief valves away from the house.
- Conducting maintenance checks on pumps, generators and water systems.
- Checking that you have sufficient personal protective clothing and equipment.
- Relocating flammable items away from your home including woodpiles, paper, boxes, crates, hanging baskets and garden furniture.
- Sealing all gaps in external roof and wall cladding.
- Checking that the first aid kit is fully stocked.

Bushfire Alerts

If you receive an emergency warning about a bushfire or other emergency, take notice as it could save your life.

There are three types of alert messages to help you make the right safety choices:

Bushfire Advice Message – a fire has started – general information to keep you up to date.

Bushfire Watch and Act Message – represents a heightened level of threat. Conditions are changing, a fire is approaching; lives may come under threat. Take appropriate action.

Bushfire Emergency Warning – is the highest level message advising of impending danger. It may be preceded with the Standard Emergency Warning Signal (SEWS).

An Emergency Warning
means there is a threat
to lives and protective
action is required
immediately.

When a bushfire strikes

You have made your decision to **PREPARE.ACT.SURVIVE**. You have prepared your property before the fire season. You have made your Bushfire Survival Plan. You have practised your Bushfire Survival Plan.

A bushfire is threatening? What do you do?

- Know the FDR for any given day.
- Regularly check the FDR on the Rural Fire Services website at www.ruralfire.qld.gov.au.
- Monitor your media outlets for warnings on bushfire activity.
- Seek out information if you have to, and do not assume that you will receive a warning.
- Leave early or stay according to your Bushfire Survival Plan.
- Act decisively in accordance with your Bushfire Survival Plan.
- Do not adopt the 'wait and see' option.

Travelling in your vehicle near a bushfire

Sheltering inside a vehicle is a high-risk strategy that can result in death. Whilst sheltering inside a vehicle offers you a slightly higher chance of survival than being caught in the open, having a leave early or stay strategy is a much safer option.

You should never take a journey into areas where the fire danger is catastrophic or extreme. You should consider postponing or finding alternative routes if necessary. If you can smell or see smoke in the distance it is best to u-turn and drive away from the danger.

If you are caught in smoke or flames while on the road:

- Turn on the vehicle's headlights and hazard warning lights.
- If you need to shelter in your vehicle drive your car into a bare, clear area well away from surrounding trees, leaving lights on. Position vehicle to prevent side impact from advancing fire front.
- Close all windows and vents.
- Leave the engine running and turn off the air conditioning system.
- Cover your entire body with woollen or cotton blankets to protect from radiant heat.
- Take shelter below the window level.
- Drink water frequently and stay in the vehicle until the fire front has passed.
- Once the fire front has passed exit the vehicle to inspect the damage and ensure other passengers are safe.

Neighbourhood Safer Places

A Neighbourhood Safer Place (NSP) is a place of last resort for people during a bushfire. An NSP may form part of a back-up plan when:

- Your Bushfire Survival Plan has failed.
- Your plan was to stay but the extent of the fire means that your home cannot withstand the impact of the fire and therefore your home is not a safe place to shelter.
- The fire has escalated to an extreme or catastrophic level and relocation is the safest option.

An NSP is an identified building or open space within the community that can provide a level of protection from the immediate life-threatening effects of a bushfire. NSPs still entail some risk, both in moving to them and while sheltering in them and cannot be considered completely safe.

They are a place of *last resort* in bushfire emergencies only. The following limitations of NSPs need to be considered within your Bushfire Survival Plan:

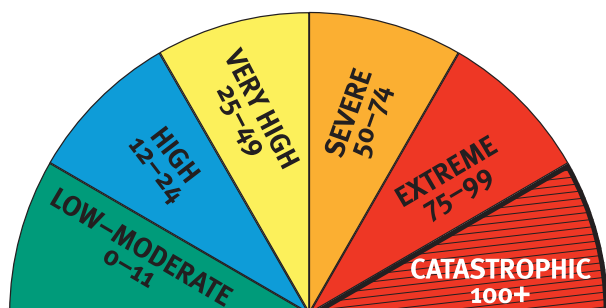
- NSPs do not cater for pets.
- Firefighters may not be present as they will be fighting the main fire front elsewhere.
- NSPs do not provide meals or amenities.
- They may not provide shelter from the elements, particularly flying embers.

If you are a person with special needs you should give consideration to what assistance you may require at an NSP.

Although QFRS cannot guarantee an immediate presence during a bushfire, every effort will be made to provide support as soon as resources are available.

If an NSP is part of your contingency plan it should not require extended travel through fire-affected areas to get there.

FIRE DANGER RATING



The Fire Danger Rating (FDR) is an early indicator of potential danger and should act as your first trigger for action. The higher the rating the greater the need for you to act.

The FDR is an assessment of the potential fire behaviour, the difficulty of suppressing a fire, and the potential impact on the community should a bushfire occur on a given day.

A Fire Danger Index (FDI) of 'low-moderate' means that fire will burn slowly and that it will be easily controlled, whereas a FDI in excess of 'catastrophic 100+' means that fire will burn so fast and so hot that it will be uncontrollable.

CATASTROPHIC 100+

A fire with a rating of 'catastrophic' may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. Many people will be injured and many homes and businesses will be destroyed.

During a 'catastrophic' fire, well-prepared and constructed homes will not be safe. Leaving is the only option for your survival.

EXTREME 75-99

A fire with an 'extreme' rating may be uncontrollable, unpredictable and fast moving. The flames will be higher than roof tops. During an 'extreme' fire, people will be injured and homes and businesses will be destroyed.

During a 'extreme' fire, well-prepared and well-constructed homes may not be safe. Leaving is the only option for your survival.

SEVERE 50-74

A fire with a 'severe' rating may be uncontrollable and move quickly, with flames that may be higher than roof tops. A 'severe' fire may cause injuries and some homes or businesses will be destroyed.

During a fire with a 'severe' rating, leaving is the safest option for your survival. Use your home as a place of safety only if it is well-prepared and well-constructed.

VERY HIGH 25-49

A fire with a 'very high' danger rating is a fire that can be difficult to control with flames that may burn into the tree tops. During a fire of this type some homes and businesses may be damaged or destroyed.

During a fire with a 'very high' danger rating, you should use your home as a place of safety only if it is well prepared and well-constructed.

HIGH 12-24

A fire with a 'high' danger rating is a fire that can be controlled where loss of life is unlikely and damage to property will be limited.

During a fire with a 'high' danger rating, you should know where to get more information and monitor the situation for any changes.

LOW-MODERATE 0-11

A fire with a 'low to moderate' rating can be easily controlled and pose little/or no risk to life or property.

During a fire with a 'low to moderate' rating, you should know where to get more information and monitor the situation for any changes.

BUSHFIRE SURVIVAL PLAN

Complete your personalised Bushfire Survival Plan lift-out.

Personal details:

Important phone numbers: **000** (Fire, Police and Ambulance)

Family:	Family:	Family:
Work:	Friends:	Friends:
School:		

Important contact details – name and phone number:

Insurer:	Policy Number:	Phone:
Electricity:		Phone:
Water:		Phone:
Gas:		Phone:
Phone Company:		Phone:
Council:	Phone:	

Leave early:

List all names and contact phone numbers of household members who have decided to leave early then complete Section 1.

Names:
Phone:

Stay:

List all names and contact phone numbers of household members who have decided to stay, then complete Section 2.

Names:
Phone:

Leave early – Section 1

Pull this Bushfire Survival Plan lift-out from this document and keep in a safe place.

Leaving early will always be the safest option for you and your family. It is extremely important for you to prepare a detailed leave early plan to ensure everyone understands what to do and when. Use the boxes below to list tasks to do.

When to go – Think of different triggers that will cause you and your family to leave early. Think about what you will do if you have sent the children to school that day. Think about whether or not you will have to travel from work into the fire zone.

Where to go – Identify one or more safer locations. Consider putting on personal protective clothing before you leave home.

How to get there – What roads will you take to your destination? Have an alternative route if your first choice is impassable.

What to take – Make a list of your most valuable items (e.g. insurance papers, electronic records, photo albums, passports, birth certificates and other important documents).

Stay – Section 2

Anyone who is not going to leave early must be involved in completing this stay and defend plan to ensure they know what to do. Every stay plan will be different depending on your circumstances. Use the boxes below to list tasks to do.

Before the fire approaches – Start getting yourself and your property ready for a bushfire.

As the fire approaches – Prepare for ember attack on or near your home.
Remember to put on personal protective clothing.

As the fire front arrives – Stay safe by monitoring the fire from inside your home.

After the fire has passed – Patrol your property and extinguish any spot fires or burning embers.
You may need to keep this up for several hours.

Everyone must have a contingency plan

Have a contingency plan – what will you do if you can't activate your Bushfire Survival Plan? Remember that leaving late can lead to loss of lives.

Know where your nearest NSP is and how to get there.

ACTIVATING YOUR BUSHFIRE SURVIVAL PLAN

Once you have prepared your Bushfire Survival Plan and completed your preparations, it is absolutely essential that you regularly practise and review your plan. This will make sure you and your family are well organised in the event of a bushfire. If a bushfire threatens the health and safety of you, your family, home or property, you should follow these steps:

Step 1 – Activate your Bushfire Survival Plan

Someone must take charge and lead other family members through this emotional experience by carefully communicating the various tasks set out in the plan. Know who is going to leave early and who is going to stay.

Step 2 – Put on your personal protective clothing

Every member of the family must change into their personal protective clothing, including long pants, long-sleeve-shirt and closed-in shoes.

Step 3A – Pack your vehicle and leave early

If your plan is to leave early, pack all valuables in your vehicle (see Relocation Kit) and relocate to your designated safer location. Give yourself enough time to get you and your family to safety. Don't return home until it is safe to do so.

Step3B – Implement your strategy to stay and defend

If your plan is to stay ensure you have all the items in the Bushfire Survival Kit ready to go. This can be a dangerous option and you should be physically and mentally prepared.

OR

Step 4 – Keep informed of bushfire activity

Listen to the radio, television, internet, firefighters and/or police for information on the fire in your local area. Bushfire is dynamic and unpredictable so you need to be prepared for the unexpected. Warnings are not guaranteed so do whatever is necessary to ensure you remain safe.

BUSHFIRE SURVIVAL KIT

You need to have a Bushfire Survival Kit stored in an area of the house that is safe and easy to access. It should contain:

- protective clothing
- mop
- gloves
- torch
- hoses
- shovel
- towels
- buckets
- safety goggles
- ladder
- medications
- bottled drinking water
- fire extinguishers
- battery operated radio
- spare batteries
- smoke mask
- woollen blankets
- first aid kit
- knapsack sprayer
- protective clothing for the whole family.



RELOCATION KIT

Write a list of all items your family will need before, during and after your relocation. The list below shows items that you might like to put in your relocation kit.

- protective clothing for the whole family
- battery operated radio and spare batteries
- safety goggles
- mobile phone and battery charger
- medications
- wallet or purse and money
- clothing (two sets of clothes for each family member)
- identity information (passports, birth certificates)
- bottled water (enough for each relocated family member)
- family and friends' phone numbers
- items of high importance (e.g. family photos, valuables, important documents)
- blankets (natural fibres)
- children's toys



BUSHFIRE RISK SELF-ASSESSMENT CHECKLIST



This basic self-assessment checklist is designed to give you a greater understanding of the bushfire risk level relevant to your property. Information provided in this assessment will assist you when completing your Bushfire Survival Plan.

Address:

Postcode:

Property Owner/Property Name:

ACCESS/EGRESS

Road/Street/Driveway PLEASE ✓ APPROPRIATE BOX

Clear of overhanging vegetation	Yes ☐	No ☐
Unrestricted gate access	Yes ☐	No ☐
Clear of overhead power lines	Yes ☐	No ☐
Able to reverse in	Yes ☐	No ☐
Turning/passing areas	Yes ☐	No ☐
Heavy vehicle access on cattle grid/bridge	Yes ☐	No ☐
Alternative way out	Yes ☐	No ☐
Two wheel drive access	Yes ☐	No ☐

STRUCTURE/S

Exterior walls – non-combustible	Yes ☐	No ☐
Roof ridge capping sealed	Yes ☐	No ☐
Eaves enclosed	Yes ☐	No ☐
Roofing gutters and valleys clear of leaf litter and fine fuels	Yes ☐	No ☐
Underfloor enclosed	Yes ☐	No ☐
Vents screened	Yes ☐	No ☐
Windows – non-combustible finishing	Yes ☐	No ☐
Deck/veranda non-combustible	Yes ☐	No ☐

WATER SUPPLY

Reticulated water supply	Yes ☐	No ☐
Tank supply with QFRS access – 50mm male camlock fitting so fire fighters can use water if needed	Yes ☐	No ☐
QFRS accessible external open water supply (dam/pool)	Yes ☐	No ☐
Firefighting pump and hose connected to water supply	Yes ☐	No ☐

Other considerations

There are a range of other things to be considered regardless of your decision to leave early or stay:

- Firefighting equipment such as pumps, hoses and sprinkler systems should be tested regularly and maintained in maximum operational working condition.
- Firefighters may need access to your property during a bushfire so it is in your best interests to allow enough space for fire trucks (4 metres wide by 4 metres high).
- Your pets, livestock and other animals require proper care and attention during fires. Consider food, medication, transportation and sleeping arrangements for your animals.

Myths versus Reality

Myths	Reality
There will always be a fire truck available to fight a bushfire threatening my home.	Firefighters may be required to fight many fronts of a large fire. Fire trucks and firefighters are finite resources so it is important they are deployed in an appropriate manner to best manage the fire.
I know the back streets in town like the back of my hand so it is OK for me to leave at the last minute.	If your decision in your Bushfire Survival Plan is to leave early, then you should leave well before the fire front reaches your property. Irrespective of your local area knowledge you must stick to your plan and leave early. Leaving late can be fatal.
Someone from an emergency service will knock on my door when it is time to leave.	Emergency services personnel may not be available to alert the community by door-knocking and encouraging you to leave. You need to monitor the bushfire alerts by listening to the radio, watching TV or checking the rural fire website. You need to be ready to leave early if your life or the people in your care are at risk.
My house will not burn down because there is more than 50 metres between my home and nearby bushland.	Most houses which burn down during bushfires have been attacked by flying embers. Under certain conditions embers can cause ignitions up to 20kms in front of the main fire. A combination of your level of preparation and your home's construction will determine the survivability of your home.
I only have to clean my gutters and mow my lawns to prepare my property for bushfire.	Fire requires fuel, heat and oxygen to occur. This means that flames or embers do not necessarily rely solely on your gutters and lawns for fuel. They might utilise overhanging trees, woodpiles, old building materials under the deck or chemicals in the garden shed to sustain them. Take the time to properly prepare your whole property, which includes yourself, your house and your land.