

# BUSHFIRE MANAGEMENT PLAN

**APPROVED BY COUNCIL**

Date: 05/02/2021

**STAGE 5 RESIDENTIAL**

**LODGED**

21/01/2021

**BCC DS**



**Lot 999 SP292596**

**Creek Road, Cannon Hill**

**Client Reference: 004.01.21**



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Should the Client have any concerns arising from this report or its content, they are requested to contact Bushfire Risk Reducers directly.

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**DOCUMENT CONTROL****Bushfire Management Plan Supplement****Client:** Urbex 109 Pty Ltd**Client Reference:** 004.01.21**Project:** RoL and MCU**Site Location:** Creek Road, Cannon Hill

Version	Date	Status	Changes	Author	Approver
Rev 0	28.10.2015	First Draft		AH	AH
Rev 1	17.11.2015	Second Draft	Increasing setbacks to achieve BAL 12.5	AH	AH
Rev 2	26.11.2015	Final Report		AH	AH
Rev 3	21.07.2016	Updated Report	Incorporating BCC IR items including design elements within bushfire protection measures	AH	AH
Rev 4	14.08.2019	New Report for Golf Course / Stage 5	Supplement to approved BMP. Address BCC requests 24 May 2019.	AH	AH
Rev 5	17.10.2019	New report for Golf Course / Stage 5 (Only approved for Golf Course component)	Supplement to approved BMP. Address BCC requests 24 May 2019.	AH	AH
Rev 6	11.01.2021	Stage 5	Update to Rev 5	AH	AH

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## 1.0 Introduction

The Cannon Hill Community Links (CHCL) project is over 125 ha, and located east of Creek Road in Cannon Hill, between Wynnum and Fursden Roads. The project incorporates four key components:

- Remediation of the former Brisbane City Council 12.5 ha Fursden Road Tip – completed, including earthworks for 3 Golf Course holes;
- Environmental works over 110 ha - including significant weed removal, bushfire management and squirrel glider habitat development – 30 ha commenced, balance subject to Golf Course commencement;
- Residential Development – 127 home sites in total. 110 home sites completed and titled to date; and
- Public eighteen-hole Golf Course.

Bushfire Risk Reducers (BRR) has been engaged to prepare this Bushfire Management Plan (BMP) for the final stage of the CHCL project comprising Stage 5 Residential. This BMP acts as a supplement to the Brisbane City Council approved:

- 2016 BMP (rev 3) prepared by BRR for the three completed residential stages of the project (refer Appendix 1 of Attachment 1 to this report); and
- 2019 BMP (rev 5) prepared by BRR for the Golf Course and Stage 5 Residential (Stage 5 Residential excluded from BCC approval of the report – copy provided at Attachment 1). –

, to be read in conjunction with this report.

The completed residential stages adjoin Stage 5 the subject of this BMP and there is significant overlap between these. This BMP supplements the current operational 2019 BMP. The BMP addresses the requirements of clause 146 of P&E Court Approval 2885/2014.



## 2.0 Site and Development Description

### 2.1 Property Description

Site ID:	Lot 999 SP292596
	Parish of Bulimba, County of Stanley.
Current address of property:	Creek Road, Cannon Hill, QLD 4170.
Local Government Area:	Brisbane City Council.
Total Area:	122.2709ha
Zoning:	Sport and Recreation

### 2.2 Proposed Development

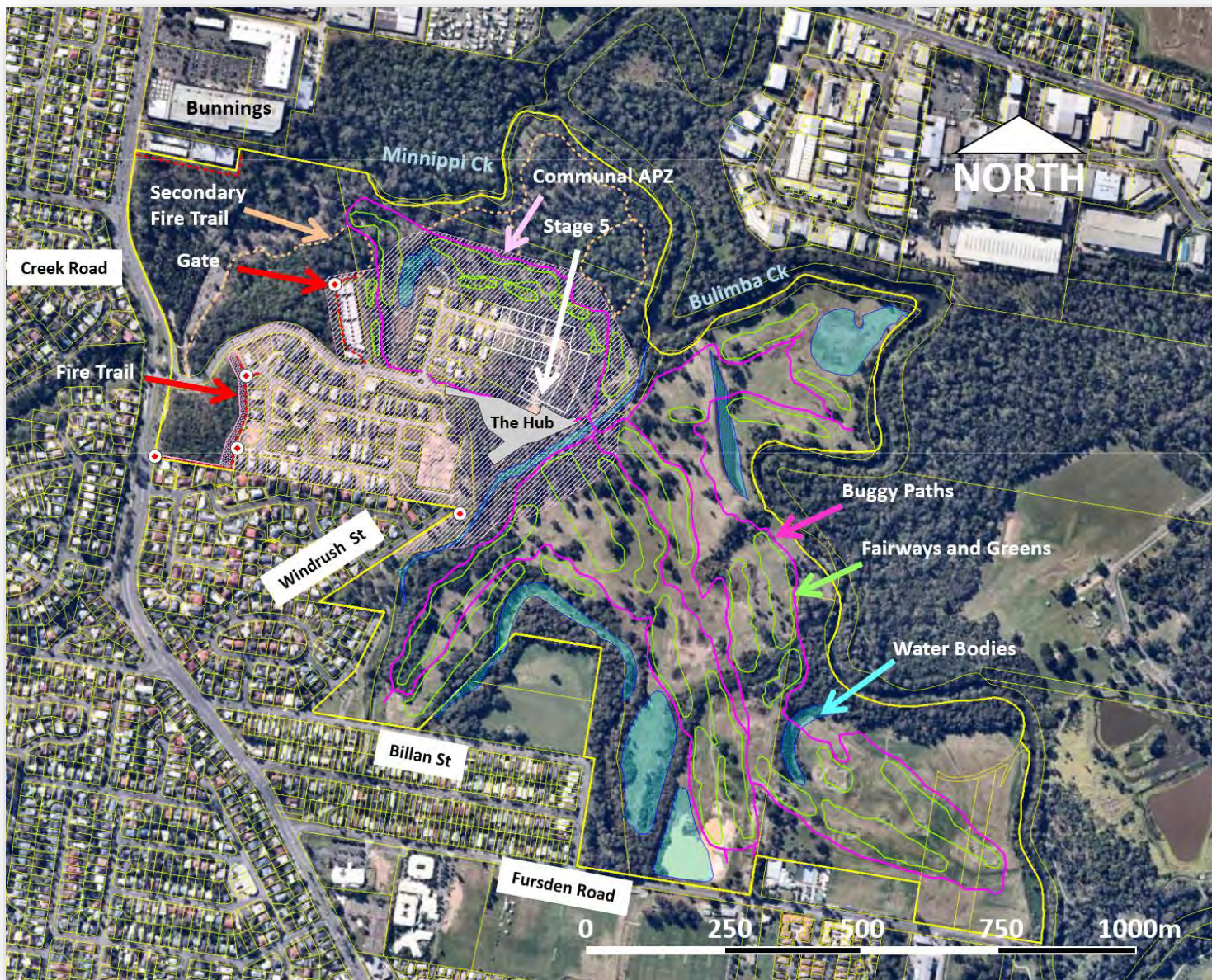
The Stage 5 development will create the final 17 of 127 residential Lots in the overall project.

### 2.3 Site Location and Layout



Figure 1. Broader area showing the location of the proposed development at its outset.





**Figure 2. Proposed development at Stage 5**



Located between Creek Road and the Gateway Motorway, the northern and eastern limits of the site are defined by Minnipi Creek and Bulimba Creek, with Fursden Road across the south.

The approved BMP establishes the justification for the fire trails and communal Asset Protection Zones (APZs) shown in Figure 2. Squirrel Glider habitat areas have been enhanced without compromising the effectiveness of the APZs, which incorporate “islands” of native vegetation that are consistent with “Low threat” vegetation under Section 2.2.3.2 of AS3959-2018. As a result construction of dwellings are either BAL 12.5 or BAL LOW under this Standard.

The management of vegetation in and around the golf course “Hub” and Stage 5 area will follow the same pattern, and will serve as both communal APZ and suitable Squirrel Glider habitat.

Figure 2 clearly shows a site which is designed to protect the community of residents and golf course patrons as well as the local Squirrel Glider population. The Squirrel Glider habitat development areas are shown on plan SK807 which is Appendix 2 of Attachment 1 to this report.

It should be noted from Figures 1 and 2 how this development has also substantially reduced the risk to existing properties to the south, in the area of Windrush Street and Fairmont Drive.

BRR continues to be involved in an ongoing inspection program which ensures that the standard of APZs and fire trails is maintained.

The site is within approximately 2km by road of the nearest Queensland Fire and Emergency Services (Cannon Hill Fire Station, Corporate Drive).

### **3.0 Plan Updates**

There are no updates to the plans approved in the 2019 BMP.

As such the plans provided at Appendix 2 of the approved 2019 BMP (refer Attachment 1) remain current.

The extent of Asset Protection Zone (APZ) remains unchanged to that approved in 2019. The APZ around Stage 5 preserves a “low threat vegetation” condition under AS3959-2018, whilst also preserving existing vegetation with habitat value which assists Squirrel Glider movement through the area and provides for waterway health, marine plant retention and general wildlife passage along the Windrush Waterway. The width of the wildlife passage between Bulimba Creek and the APZ is maintained at a minimum of 35 meters per the BMP approved in 2016 and 2019.

### **4.0 Response to Development Approval Conditions**

The Bushfire Management Plan has been prepared to address the relevant Development Approval Conditions of the Planning and Environment Court Order, BD 2885 of 2014. The following provides detail of the relevant conditions addressed by the BMP and a response to each.

#### Section 9 – Condition 146:

Submit and obtain approval from the Delegate, Development Assessment for a Bushfire Management Plan for the reconfiguration.

A) The Bushfire Management Plan is:

- To be undertaken in accordance with the requirements of State Planning Policy 1/2003;

The approved operational Bushfire Management Plan for the CHCL project and this supplementary report have been prepared in accordance with State Planning Policy 1/2003.

- To specify a strategy to ensure that any dwellings constructed are not exposed to an unacceptable hazard; and

The APZ developed and approved under the existing BMP ensures that any dwellings constructed in Stage 5 will have either a Bushfire Attack Level (BAL) of BAL LOW or a maximum of BAL 12.5 under AS3959-2018.

- The proposed strategy is to specifically exclude any reliance upon vegetation clearance outside of the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.

No vegetation clearance is required outside the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.

B) Implement and maintain the Approved Bushfire Management Plan.

It is the responsibility of those undertaking the works to complete the works in accordance with the approved Bushfire Management Plan. Responsibility for ongoing implementation of the BMP will be with Brisbane City Council, following practical completion of the Golf Course and handover of same to BCC.

## 5.0 Conclusion

This supplementary report demonstrates compliance with the relevant Development Approval Conditions of the Planning and Environment Court Order, BD2885 (2014) and confirms there are no updates to the existing approved operational Bushfire Management Plan for the CHCL project.

## Attachment 1 Approved BMP 2019

# BUSHFIRE MANAGEMENT PLAN

## GOLF COURSE & STAGE 5 RESIDENTIAL



Lot 8 RP131169, Lots 1 & 2 RP13170, Lot 100 SP280777, Lot 901 SP280792, Lots 134 and 135 SP280792, Lot 999 SP292596

### Creek Road, Cannon Hill

Client Reference: 004.08.19



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## 1.0 Introduction

The Cannon Hill Community Links (CHCL) project is over 125 ha, and located east of Creek Road in Cannon Hill, between Wynnum and Fursden Roads. The project incorporates four key components:

- Remediation of the former Brisbane City Council 12.5 ha Fursden Road Tip – completed, including earthworks for 3 Golf Course holes;
- Environmental works over 110 ha - including significant weed removal, bushfire management and squirrel glider habitat development – 30 ha commenced, balance subject to Golf Course commencement;
- Residential Development – 127 home sites in total. 110 home sites completed and titled to date; and
- Public eighteen-hole Golf Course.

Bushfire Risk Reducers (BRR) has been engaged to prepare this Bushfire Management Plan (BMP) for the final stages of the CHCL project comprising Public Golf Course and Stage 5 Residential. This BMP acts as a supplement to the 2016 BMP prepared by BRR for the three completed residential stages of the project and approved by Brisbane City Council – refer copy at Appendix 1, to be read in conjunction with this report.

The completed residential stages adjoin those the subject of this BMP and there is significant overlap between these. This BMP supplements the current operational 2016 BMP with updates to key figures and consideration of Golf Course operation. The BMP addresses the requirements of clauses 34 and 146 of P&E Court Approval 2885/2014.

## 2.0 Site and Development Description

### 2.1 Property Description

Site ID: Lot 8 RP131169, Lots 1 & 2 RP13170, Lot 100 SP280777, Lot 901 SP280792, Lots 134 and 135 SP280792, Lot 999 SP292596

Parish of Bulimba, County of Stanley.

Current address of property: Creek Road, Cannon Hill, QLD 4170.

Local Government Area: Brisbane City Council.

Total Area: 122.2709ha

Zoning: Sport and Recreation

### 2.2 Proposed Development

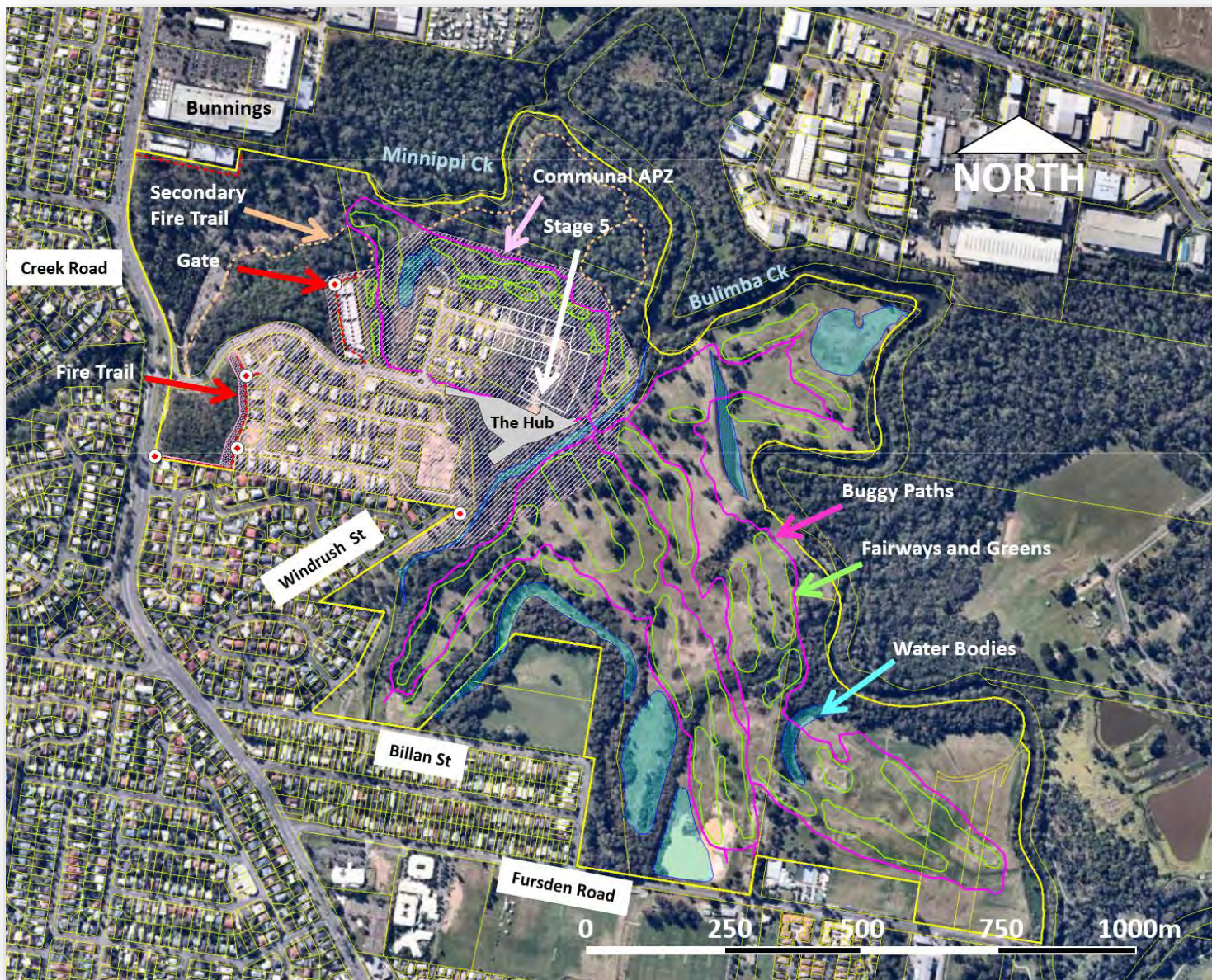
The proposed development is planned to create the final 17 of 127 residential Lots in Stage 5 and enable the construction of an 18 hole Golf Course, together with remediation and weed management of the area generally in order to provide a safe and appealing local amenity with significant ecological and habitat value.

### 2.3 Site Location and Layout



**Figure 1. Broader area showing the location of the proposed development at its outset.**





**Figure 2. Proposed development at Stage 5**



Located between Creek Road and the Gateway Motorway, the northern and eastern limits of the site are defined by Minnippi Creek and Bulimba Creek, with Fursden Road across the south.

The approved BMP establishes the justification for the fire trails and communal Asset Protection Zones (APZs) shown in Figure 2. Squirrel Glider habitat areas have been enhanced without compromising the effectiveness of the APZs, which incorporate “islands” of native vegetation that are consistent with “Low threat” vegetation under Section 2.2.3.2 of AS3959-2018. As a result construction of dwellings are either BAL 12.5 or BAL LOW under this Standard.

The management of vegetation in and around the golf course “Hub” area will follow the same pattern, and will serve as both communal APZ and suitable Squirrel Glider habitat.

Figure 2 clearly shows a site which is designed to protect the community of residents and golf course patrons as well as the local Squirrel Glider population. The Squirrel Glider habitat development areas are shown on plan SK807 which is attached in Appendix 2.

The access / egress route for the site flows in an east west alignment, without exposing residents, visitors or golf course patrons to unacceptable levels of risk. The golf course environment will consist of large open low hazard areas, with obvious safe routes back to the Hub in the event of local fire incidents. Given the very limited areas of retained hazard, the high degree of fragmentation and the high moisture condition associated with Minnippi Creek and Bulimba Creek, the bushfire threat has reduced to low and acceptable levels. The approved habitat islands and marine plant zone represent only a low hazard. The marine plant zone along the Windrush Street waterway channel will be left unmanaged in its natural state and marine vegetation will not be removed for APZ management purposes.

The residual risk associated with golf course operations is addressed in Section 4 of this Supplementary Report.

It should be noted from Figures 1 and 2 how this development has also substantially reduced the risk to existing properties to the south, in the area of Windrush Street and Fairmont Drive.

BRR continues to be involved in an ongoing inspection program which ensures that the standard of APZs and fire trails is maintained.

The site is within approximately 2km by road of the nearest Queensland Fire and Emergency Services (Cannon Hill Fire Station, Corporate Drive).

### **3.0 Plan Updates**

Site Plans SK047 and SK049 provided at Appendix 2 of the operational BMP have been updated with as-constructed survey data, with additional plans provided to cover the Golf Course area. The updated and additional plans are provided at Appendix 2 of this report.

The extent of Asset Protection Zone (APZ) is consistent with that already approved and responds to minor infrastructure location changes. The APZ around the Golf Course Hub preserves a “low threat vegetation” condition under AS3959-2018, whilst also preserving existing vegetation with habitat value which assists Squirrel Glider movement through the area and provides for waterway health, marine plant retention and general wildlife passage along the Windrush Waterway. The width of the wildlife passage to Bulimba Creek and the Stage 5 APZ is maintained at a minimum of 35 meters per the BMP approved in 2016.

## 4.0 Golf Course and Emergency Management Arrangements

Physical construction of the Golf Course will be approved by an Operational Works approval to be issued by the Brisbane City Council (BCC). Operation of the Golf Course will be undertaken by BCC (golf course owner) and/or their appointed Golf Course Operator.

A Further Issues request (27 May 2019) requests the following:

*Please also include a section in the report which discusses any relevant operational requirements for the golf course in terms of bushfire events occurring in the nearby bushland areas, including the following matters:*

- *Procedures for reporting bushfire incidents.*
- *Protocols for communication with disaster management response agencies (e.g. QFES, BCC).*
- *Evacuation and Emergency Response Procedures in a bushfire event.*
- *Protocols for operations when hazard reduction burning is occurring in the vicinity of the golf course*
- *Protocols for suspension of operation of the facility for when closure of the facility is advised by QFES or other relevant authority due to bushfire incident.*
- *Signage on site showing evacuation routes and muster points in the event of a bushfire*
- *Requirements for staff training and resourcing including equipment required, and protocols for communication and evacuation in a bushfire event.*

The design of the course has considered access to and from the immediately adjacent public road access points, being Minnippi Boulevard, Billan Street and Fursden Road. Between these points and throughout the course a network of access paths provides access to each golf hole and course area – refer Plan SK901 at Appendix 2. This proposed network is appropriate for access to and from the Golf Course during emergency situations including bushfire.

Golf course patrons would not be faced immediately by a fully developed fire burning on a wide front, without warning. Fuel zones are generally fragmented and reduced in size by roads and water bodies so that potential size of fire is reduced and patrons would become aware of ignition by smoke blowing towards them.

There is ample access and egress from the golf course along a safe route. At the first sign of ignition golf course patrons would naturally move away from the developing fire/smoke and towards the golf hub, which provides a safe place of refuge. The Golf Course Operator would call 000 and report the fire, which will likely have others reporting it. Responding emergency services incident control will be assumed by QFES/QPS who will provide direction to the Golf Course Operator and patrons assembled at the Golf Hub. This includes the direction to close the course. A sign reading “Golf Course Closed” will be put up at the entry point to the site, if safe to do so, by the Golf Course Operator.

During the bushfire and storm season, golf course patrons will be issued a small flyer entitled (“In the Event of Emergency”). The flyer will direct patrons, at the first sign of danger (ignition of fire, severe lightning or hail) to relocate immediately to the Golf Hub, from where either shelter or evacuation will be managed. Evacuation will not be encouraged if the conditions outside are unsafe (eg. Thick smoke or severe hail). The normal “Emergency Muster Point” and associated signage for structural fire within the Hub will be outdoors, which is not appropriate for bushfire. In the event of bushfire, the Golf Course Operator will hang a second sign on top of the existing green “Emergency Muster Point” sign. The second sign will read “In event of bushfire shelter inside Hub Building”.

When hazard reduction burns are planned, the Golf Course Operator will liaise with the burn controller (Council/QFES) the day prior to the burn and give consideration to forecast wind conditions and burn



conditions generally. If there is any prospect of patrons being affected by smoke the course should be closed until conditions have returned to normal after the burn.

As the Golf Course Operator (BCC or appointee) will be responsible for all ongoing management arrangements including hours of operation, staffing levels and management plans including hazard and emergency (not just bushfire, but also natural hazards such as flood, electrical storms and hail) it is premature to develop very detailed bushfire hazard and emergency management plans before the Golf Course Operator is appointed.

Once appointed, the Golf Course Operator should be required by BCC to develop standard operating procedures dealing with natural hazard and emergency management, which will be subject to review and approval by Brisbane City Council.

## **5.0 Response to Development Approval Conditions**

The Bushfire Management Plan has been prepared to address the relevant Development Approval Conditions of the Planning and Environment Court Order, BD 2885 of 2014. The following provides detail of the relevant conditions addressed by the BMP and a response to each.

Section 3 – Condition 34:

Submit and obtain approval from the Delegate, Development Assessment for a Bushfire Management Plan for the golf course development.

A) The Bushfire Management Plan is:

- To be undertaken in accordance with the requirements of State Planning Policy 1/2003;

The approved operational Bushfire Management Plan for the CHCL project and this supplementary report have been prepared in accordance with State Planning Policy 1/2003.

- To specify a strategy to ensure that any dwellings constructed are not exposed to an unacceptable hazard; and

No dwellings will be constructed within the Golf Course.

The Golf Course design provides (within the Golf Course lot) a bushfire management trail network and an APZ for dwellings constructed in Stages 2, 3, 4 and 5 of the CHCL project.

- The proposed strategy is to specifically exclude any reliance upon vegetation clearance outside of the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.

No vegetation clearance is required outside the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.

B) Implement and maintain the Approved Bushfire Management Plan.

It is the responsibility of those undertaking the works to complete the works in accordance with the approved Bushfire Management Plan. Responsibility for ongoing implementation of the BMP will be with Brisbane City Council, following practical completion of the Golf Course and handover of same to BCC.

Section 9 – Condition 146:

Submit and obtain approval from the Delegate, Development Assessment for a Bushfire Management Plan for the reconfiguration.

C) The Bushfire Management Plan is:

- To be undertaken in accordance with the requirements of State Planning Policy 1/2003;

The approved operational Bushfire Management Plan for the CHCL project and this supplementary report have been prepared in accordance with State Planning Policy 1/2003.

- To specify a strategy to ensure that any dwellings constructed are not exposed to an unacceptable hazard; and

The APZ developed and approved under the existing BMP ensures that any dwellings constructed in Stage 5 will have either a Bushfire Attack Level (BAL) of BAL LOW or a maximum of BAL 12.5 under AS3959-2018.

- The proposed strategy is to specifically exclude any reliance upon vegetation clearance outside of the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.

No vegetation clearance is required outside the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.

D) Implement and maintain the Approved Bushfire Management Plan.

It is the responsibility of those undertaking the works to complete the works in accordance with the approved Bushfire Management Plan. Responsibility for ongoing implementation of the BMP will be with Brisbane City Council, following practical completion of the Golf Course and handover of same to BCC.

## **6.0 Conclusion**

This supplementary report details updates to the existing approved operational Bushfire Management Plan for the CHCL project. Compliance with the relevant Development Approval Conditions of the Planning and Environment Court Order, BD2885 (2014) is demonstrated.

## **Appendix 1**

## **Approved BMP 2016**

# BUSHFIRE MANAGEMENT PLAN

**Received**

**03/08/2016**

**BCC DA**

**AMENDED IN RED**

**02/09/2016**

**Approved Plan**

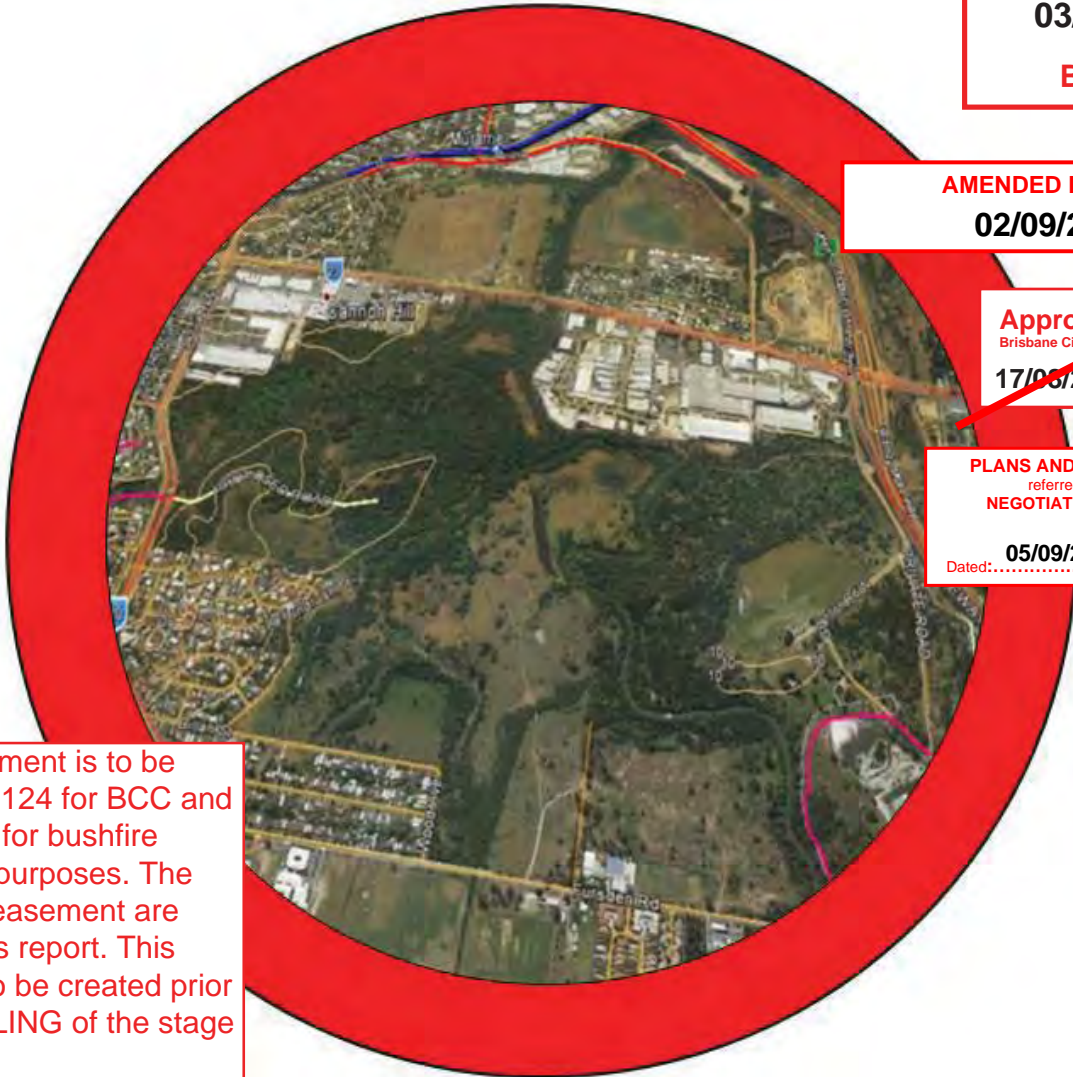
Brisbane City Council

**17/09/2016** ☒

**PLANS AND DOCUMENTS**  
referred to in the  
**NEGOTIATED DECISION**

**05/09/2016**

Dated:.....



Note: an easement is to be created on lot 124 for BCC and QFES access for bushfire management purposes. The details of the easement are included in this report. This easement is to be created prior to PLAN SEALING of the stage 2 lots.

**Lots 1 – 3/RP192319, Lots 2 & 3/RP131677, Lot780/SL8809, Lot140/SL10551,  
Lot6/RP13173, Lots 1 & 2/RP74256**

**Creek Road, Cannon Hill**

**Client Reference: 008.10.15**



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**DOCUMENT CONTROL****Bushfire Management Plan**

**Client:** BMD Consulting

**Client Reference:** 009.10.15

**Project:** RoL and MCU

**Site Location:** Creek Road, Cannon Hill

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## 1.0 Introduction

This report has been commissioned by BMD Property in order to support a Development Application for the Material Change of Use (MCU) and Realignment of a Lot (ROL) of Lots 1 – 3/RP192319, Lots 2 & 3/RP131677, Lot 780/SL8809, Lot 140/SL10551, Lot 6/RP13173, Lots 1 & 2/RP74256; and also in compliance with the Building Code of Australia (BCA), in respect of future residential buildings on the new Lots created by the subdivision.

This report addresses DA Conditions 17, 34, 74, 110, 128, 146 and 162 whereby the proposal is required to *submit and obtain approval the Delegate, Development Assessment for a Bushfire Management Plan for the reconfiguration.*

a) *The Bushfire Management Plan is:*

- *To be undertaken in accordance with the requirements of State Planning policy 1/2003;*
- *To specify a strategy for ensuring that any dwellings constructed are not exposed to an unacceptable bushfire hazard; and*
- *The proposed strategy is to specifically exclude any reliance upon vegetation clearance outside of the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.*

b) *Implement and maintain the Approved Bushfire Management Plan.*

The principle current Lots addressed by this Plan are Lots 1 – 3/RP192319 which will support or influence a new built environment; whilst the remaining Lots are to be occupied by the proposed new golf course which will modify and generally manage the present hazard, providing golfers with multiple options to move away from the effects of fire in the event of a local outbreak.

Brisbane City Council (BCC) bushfire hazard overlay mapping classifies the Subject Lot as “bushfire prone area” (BPA). The hazard mapping is created 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 State Planning Policy (SPP) 01/03 (*Mitigating the adverse impacts of flood, bushfire and landslide*). SPP 01/03 was replaced by Single State Planning Policy (December 2013, current version April 2016) accompanied by *A new methodology for State-wide mapping of bushfire prone areas in Queensland* (CSIRO 2014) with draft bushfire hazard mapping which also designates the Subject Lot a BPA.

The designation by Council of land being “bushfire prone” has two main implications:

1. It requires the production of a Bushfire Management Plan which complies with the Planning Scheme (in this case Part 8.2.5 (Bushfire Overlay Code) of the Brisbane City Plan 2014).
2. It invokes the Building Code of Australia (BCA), requiring compliance with its bushfire related function performance objectives and with AS3959-2009 *Construction of buildings in bushfire prone areas*.

This Bushfire Management Plan demonstrates compliance with SPP01/03. It objectively 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 AS3959-2009. 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:	Lots 1 – 3/RP192319, Lots 2 & 3/RP131677, Lot 780/SL8809, Lot140/SL10551, Lot6/RP13173, Lots 1 & 2/RP74256. Parish of Bulimba, County of Stanley.
Current address of property:	Creek Road, Cannon Hill, QLD 4170.
Local Government Area:	Brisbane City Council.
Total Area:	122.2709ha
Zoning:	Sport and Recreation

### 2.2 Proposed Development

The proposed development is planned to create 127 residential Lots in four Stages, the sale of which will fund the construction of an 18 hole Golf Course, and remediation and weed management of the area generally in order to provide a safe and appealing local amenity.

### 2.3 Site Location and Layout



**Figure 1. Broader area showing the location of the proposed development.**

Located between Creek Road and the Gateway Motorway, the northern and eastern limits of the site are defined by Minnippi Creek and Bulimba Creek, with Fursden Road across the south.



The proposed development interfaces with very little remnant vegetation that is mapped by the Department of Natural Resources and Mines, but BCC maps the majority of the site as having “High Ecological Value”.

The area assessed as interfacing with the future built environment is significantly degraded with invasions by a range of plant species, be they trees (Cadagi – *Corymbia torrelliana*, African Tulip – *Spathodea campanulata*, Camphor Laurel – *Cinnamomum camphorum*), woody weeds (*Lantana camara*, *Solanum spp*, *Baccharis sp*) vines (*Asparagus spp*, *Ipomoea spp*) and others. The development is expected to remediate problem areas with a considerable amount of revegetation.

Protection of non juvenile trees is seen as particularly important in the northern half of the site with squirrel glider habitat a key concern. In these areas thick stands of *Acacia spp* are adding little value in this respect along with *Lantana camara*. In the majority of communal areas associated with the Golf Course, it is anticipated that an open parklike environment will be established, retaining non juvenile trees but mowing a grassed surface to preserve line-of-sight and safety close to waterways, simultaneously mitigating fire hazard.



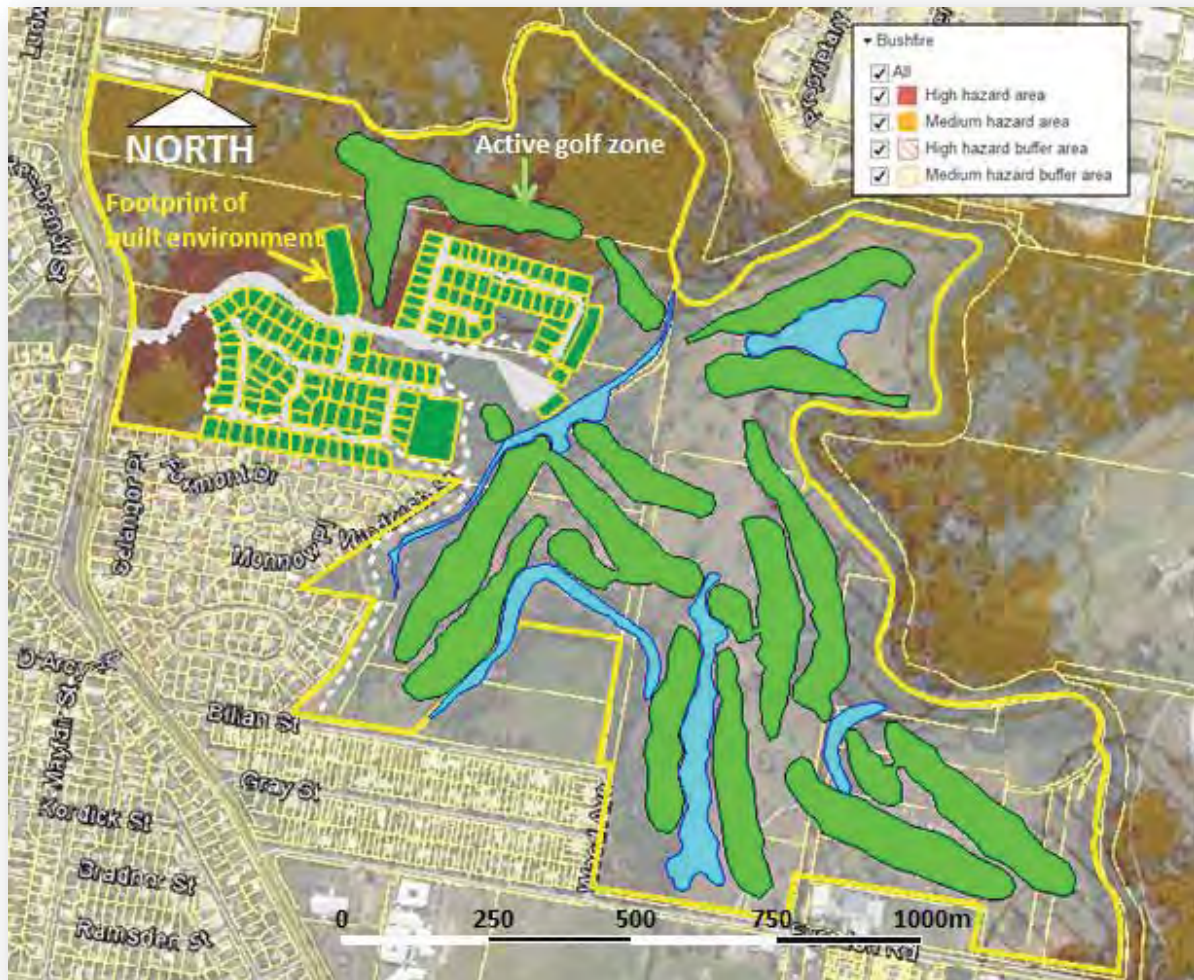
**Figure 2. Proposed Subdivision and Golf Course**

The site is within approximately 2km by road of the nearest Queensland Fire and Emergency Services (Cannon Hill Fire Station, Corporate Drive).



## 3.0 Bushfire Hazard Assessment

### 3.1 Bushfire hazard classification



**Figure 3. Council bushfire hazard mapping** (Source: BCC, 2014)

Figure 3 shows the location of the site in relation to designated “bushfire prone area” (BPA) mapped on the basis of SPP 01/03 bushfire hazard mapping methodology applied by Council, which is likely to have classified the area across the western and northern interfaces where the built environment is generally located, as validated in Table 1. The area around the Hub is not designated by Council as BPA, and nor is the majority of the area destined for the golf course to the south east.

Bushfire hazard assessment SPP 01/03 NHMA Methodology		
Date: 20 <sup>th</sup> October 2015		
Characteristic	Description	Hazard score
Vegetation	H16 Smooth barked apple/spotted gum woodland	6
Slope	Rolling Hills (> 10 - 20%)	3
Aspect	North to north west	3.5
<b>Total hazard score</b>	<b>Medium</b>	<b>12.5</b>

**Table 1. NHMA Methodology as used in SPP01/03 and Council Bushfire Hazard Overlay Mapping**

“Bushfire Prone Land” is defined under Section 12 of Building Regulation 2006, the BCA and SPP01/03 as an area **identified as such by Local Government** (using the methodology specified in Appendix 3 of SPP01/03 and applied by Council in SC6.4 *Bushfire Planning Scheme Policy*); and using “medium and high hazard” as indicators of bushfire prone land. The BCA calls up AS3959-2009 as providing “Deemed to Satisfy” construction levels for Class 1, 2 and 3 buildings constructed in bushfire prone areas.

AS3959-2009 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 affected Lots, using a combination of Methods 1 and 2 approach under AS3959-2009.

SPP 01/03 was replaced by Single State Planning Policy (December 2013) accompanied by *A new methodology for State-wide mapping of bushfire prone areas in Queensland* (CSIRO 2014) with bushfire hazard mapping shown in Figure 4 which designates the entire built environment as “bushfire prone area” (BPA).



**Figure 4. State bushfire hazard mapping** (Source: Queensland Government, 2014)

Accuracy of both sets of hazard mapping is subject to groundtruthing, which this report does in Section 6.3 and shows to be of only medium hazard.



### 3.2 Vegetation Assessment, Slope and Separation Distances from Proposed Development



**Figure 4. Potential Fuel Zones Assessed**

In the context of AS3959-2009, the vegetation type in intact fuelled zones is “Forest”.

Fuel assessments were undertaken in twelve (12) key areas across the site to objectively determine the potential nature and severity of bushfire under worst case conditions (Fire Danger Index of 60). The results are presented in Appendix 1.

Effective slope under the fuel zone varies across the site with approximate values given in Table 2 for affected Lots.

The projected fire paths and the “worst” average slope under vegetation, affecting each lot are considered.

These values are carried forward to a determination of approximate fire-line intensity and required setback to avoid subjecting buildings to a Bushfire Attack Level of greater than BAL 19 under AS3959-2009.

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 BMP.

Fuel assessments were determined using the Overall Fuel Hazard Assessment - Research Report No. 82 4th Edition, (Hines et al, 2010).



### 3.3 Fuel Accumulation Assessment Summary

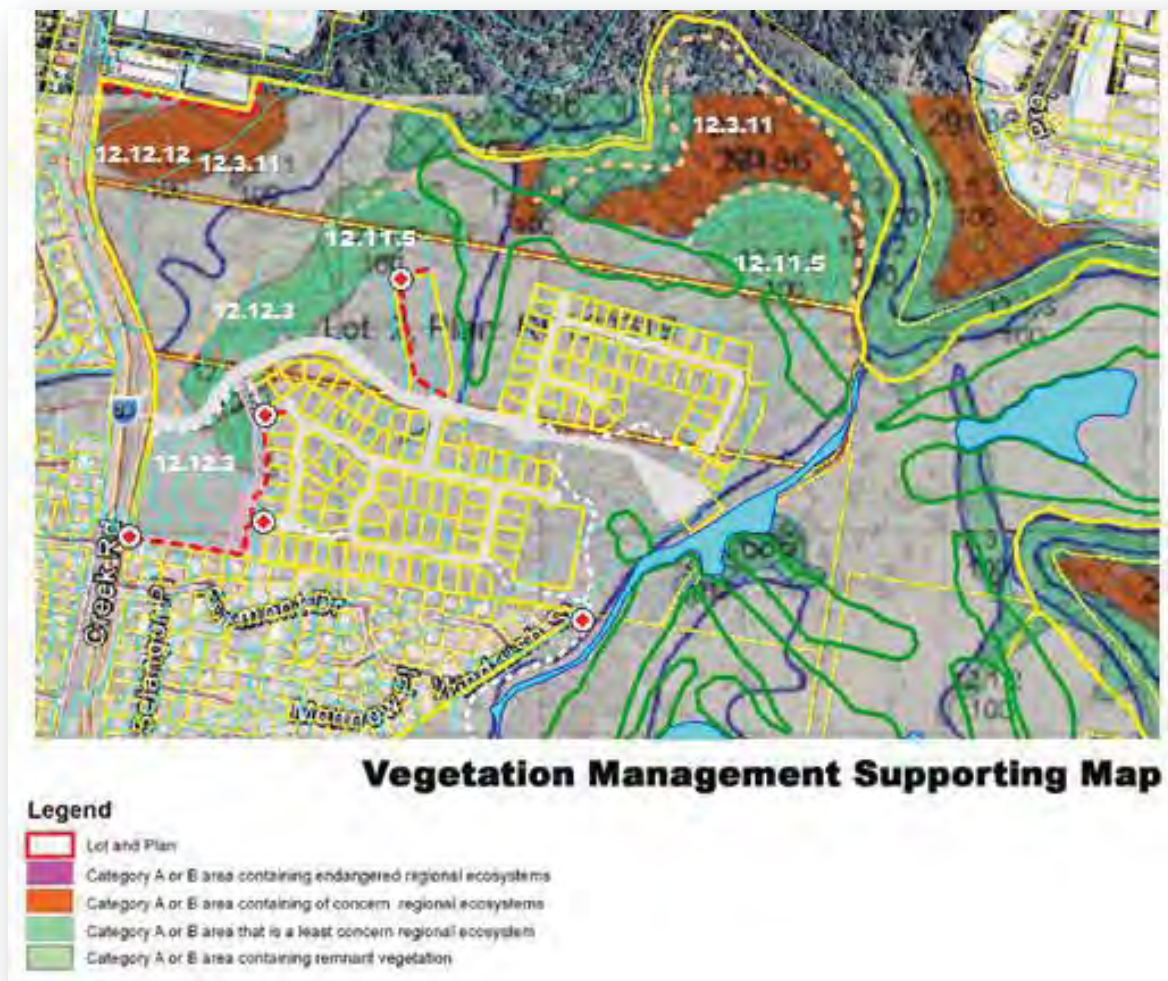
Details and evidence of fuel assessments undertaken is provided in Appendix 1 for which Table 2 is a summary.

Fuel Area	Lots Affected	Fuel Load (S+NS)/ Total  t/ha	Fuel width (Flame width)  m	Slope (Degrees/ Orientation)  °
1	24	14/18	40	6 Down 0 7 Down 7 Down 3 Down 3 Down 3 Down 3 Down 0
2	23	8/14	100	
3	17 – 22	8/14	100	
4	1-6, 14-17, 77, 124	8/14	100	
5	78, 124	10/16	20	
6	80 - 87	10/16	30	
7	87 - 93	10/16	30	
8	94 - 125	10/16	30	
9	126	9/14	35	
10	Riparian strip beside Hub to be landscaped – Low Hazard State			
11		8/15	To be mown parkland (mown between large mature trees) – Low Hazard State	
12	Golf Course to be landscaped – Low Hazard State			

**Table 2. Fuel Loads, Flame Widths and Slope affecting new Lots  
(Refer to Site Plan Drawing Number SK047 included as Appendix 4)**

These values are carried forward to Section 6 for determination of the potential nature and intensity of bushfire under worst case scenarios.

## 4.0 Site constraints and environmental values which may limit mitigation options



**Figure 5. Regional Ecosystem (RE) Mapping** (Orange dotted lines represent fire trails for consideration. Red dotted lines are recommended fire trails).

Figure 5 shows the location of the proposed development in relation to vegetation mapped by the Queensland Department of Natural Resources and Mines as “Of Least Concern” RE 12.12.3 and 12.11.5 northwest of the entrance way and residential area. Site layout has sought to avoid area of remnant vegetation.

DNRM provides the following Description and recommended fire guidelines for the vegetation communities mapped.

Regional Ecosystem	Description	Fire Guidelines
<b>RE 12.12.3</b>	Open-forest complex in which spotted gum is a relatively common species. Canopy trees include <i>Corymbia citriodora</i> , <i>Eucalyptus crebra</i> (drier sub coastal ranges) or <i>Eucalyptus siderophloia</i> , <i>E. major</i> and/or <i>E. longirostrata</i> , <i>E. acmenoides</i> or <i>E. portuensis</i> , <i>E. eugenioides</i> . Hills and	SEASON: Summer to winter. INTENSITY: Low to moderate. a. Plan for low to moderate. Unplanned occasional high intensity wildfire will occur. INTERVAL: 4-25 years. a. 4-8 years maintains a healthy grassy system. 8-20 years for shrubby elements of understorey. 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. a. Aim for 40-60% mosaic burn. Needs

	<p>ranges. Other species that may be present locally include <i>Corymbia intermedia</i>, <i>C. trachyphloia</i>, <i>Eucalyptus tereticornis</i>, <i>E. propinqua</i>, <i>E. moluccana</i>, <i>E. decolor</i>, <i>E. melliodora</i>, <i>E. carnea</i>, <i>E. fibrosa</i> subsp. <i>fibrosa</i> and <i>Angophora leiocarpa</i>. <i>Lophostemon confertus</i> (tree form and whipstick form) often present in gullies or as a sub canopy or canopy tree especially on granite. Mixed understorey of grasses, shrubs and ferns. Occurs on Mesozoic to Proterozoic igneous rocks. (BVG1M: 10b)</p>	<p>disturbance to maintain RE structure (eucalypt overstorey with open understorey of predominantly non-rainforest species). 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. a. Frequent fire is needed to maintain understorey integrity, keeping more mesic species low in the profile of the understorey so that other species can compete. It is essential that wildfires are not the sole source of fire in this ecosystem. High intensity fires occur periodically through time, however frequent low to moderate intensity fires will create the disturbance required to keep the understorey diverse. A follow-up burn soon after a high intensity wildfire can be considered to reduce germinating mesic species. This RE may contain a high number of rare and threatened plant species which require appropriate fire management.</p>
<b>RE 12.11.5a</b> <b>Least Concern</b>	<p>Open forest of <i>Eucalyptus tindaliae</i>, <i>Eucalyptus carnea</i> +/- <i>Corymbia citriodora</i> subsp. <i>variegata</i>, <i>Eucalyptus crebra</i>, <i>Eucalyptus major</i>, <i>E. helidonica</i>, <i>Corymbia henryi</i>, <i>Angophora woodsiana</i>, <i>C. trachyphloia</i> (away from the coast) or <i>E. siderophloia</i>, <i>E. microcorys</i>, <i>E. racemosa</i> subsp. <i>racemosa</i>, <i>E. propinqua</i> (closer to the coast). Occurs on Palaeozoic and older moderately to strongly deformed and metamorphosed sediments and interbedded volcanics. (BVG1M: 9a)</p>	<p>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.</p>
<b>RE 12.3.11</b> <b>Of Concern</b>	<p>Open-forest to woodland of <i>Eucalyptus tereticornis</i>, <i>E. siderophloia</i> and <i>Corymbia intermedia</i>. <i>Corymbia tessellaris</i>, <i>Lophostemon suaveolens</i> and <i>Melaleuca quinquenervia</i> frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include <i>Angophora leiocarpa</i>, <i>E. exserta</i>, <i>E. grandis</i>, <i>C. trachyphloia</i>, <i>C. citriodora</i>, <i>E. latisinensis</i>, <i>E. tindaliae</i>, <i>E. racemosa</i>, <i>Melaleuca sieberi</i> and <i>M. viridiflora</i>. <i>E. seeana</i> may be present south of Landsborough. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y (BVG1M: 16c)</p>	<p>SEASON: Summer to late-autumn. INTENSITY: Low. INTERVAL: 3-6 years. STRATEGY: Aim to burn 40-60% of any given area. Spot ignition in cooler or moister periods encourages mosaics. ISSUES: Control of weeds is a major focus of planned burning in most areas. Maintain ground litter and fallen timber habitats by burning only with sufficient soil moisture. Burning should aim to produce fine scale mosaics of unburnt areas.</p>
<b>RE 12.12.12</b> <b>Of Concern</b>	<p><i>Eucalyptus tereticornis</i>, <i>E. crebra</i> (sometimes <i>E. siderophloia</i>) open-forest to woodland. Other species present can include <i>Eucalyptus melanophloia</i>, <i>Corymbia tessellaris</i>, <i>Angophora subvelutina</i>, <i>A. leiocarpa</i>, <i>C. clarksoniana</i> (central and northern parts) and <i>E. siderophloia</i>, <i>C. intermedia</i> with</p>	<p>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</p>



	<i>Melaleuca quinquenervia</i> , <i>Lophostemon suaveolens</i> near drainage lines in moister areas. Occurs on Mesozoic to Proterozoic igneous rocks, especially granite lowlands and basins. (BVG1M: 9h)	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.
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**Table 4. Regional Ecosystems Descriptions and Fire Guidelines**

Site assessment of most of the vegetation interfacing with the built environment reveals a highly disturbed site with heavy weed invasions and relatively low biodiversity. The main areas of mapped remnant vegetation are generally well away from the built environment and associated with Bulimba Creek where Regional Ecosystems 12.3.11 and 12.12.12 also have an ecological need for fire.

BCC have dedicated resources for managing planned fire but they are not unlimited. Their work is likely to be prioritized for interface zone fuel blocks and/or areas of particularly high conservation value (that are not as degraded and weed infested as some of the retained vegetation associated with this site. For that reason, this Plan has only recommended the most obvious and practical fire trails needed. It has however proposed further fire trails for consideration. The decision to construct more fire trails at the ecotones of different Regional Ecosystems and areas with differing fire regime requirements has been left to Council to consider.

#### 4.1 Fire History and Frequency

This study found evidence of prior fire across most fuel areas, but the age of the evidence exceeded 20 years. The possibility of fire at some time has to be regarded as possible, potentially coinciding with maximum fuel accumulation and worst case fire weather conditions.



**Figure 6. Old evidence of previous fire**



## 4.2 Biodiversity Overlay

Indicative fire trail locations. Final locations to be determined on site by Council officers.

Figure 7 shows the comparatively larger areas mapped by BCC as having “High Ecological Significance”. The approved layout has sought to avoid locating the built environment within these areas.



**Figure 7. Biodiversity Overlay** (Orange dotted lines represent fire trails for consideration. Red dotted lines are recommended fire trails.)

Consideration could also be given to a further fireline above the Bulimba Creek bank in order to support the management of revegetation areas, either in terms of managed fire or weed control, or a combination of both.

The commitment to additional fire lines must be made with the intent to actively use and maintain them, and a realisation of the cost involved, along with the potential for unauthorised use.

The viability of the proposed design, in terms of achieving the planning scheme outcomes of safety to life and property, does not depend on additional fire trails to those identified in red in Figure 7 above.

## 5.0 Specific risk factors associated with the development proposal

### 5.1 Nature of activities anticipated on site

Normal residential activities are anticipated to occur in the area, which includes the potential inclination of juveniles and others to make temporary “camps” in bushland, and others to engage in acts of arson. The number of fire incidents expected by QFES varies in direct proportion to the numbers of people present. The proposed development does not add significantly to the number of people living in the area or likely to cause ignition.

The proposed Golf Course formalises the use and surveillance across the area, reducing fuelled areas and reducing the potential for unseen antisocial activity.

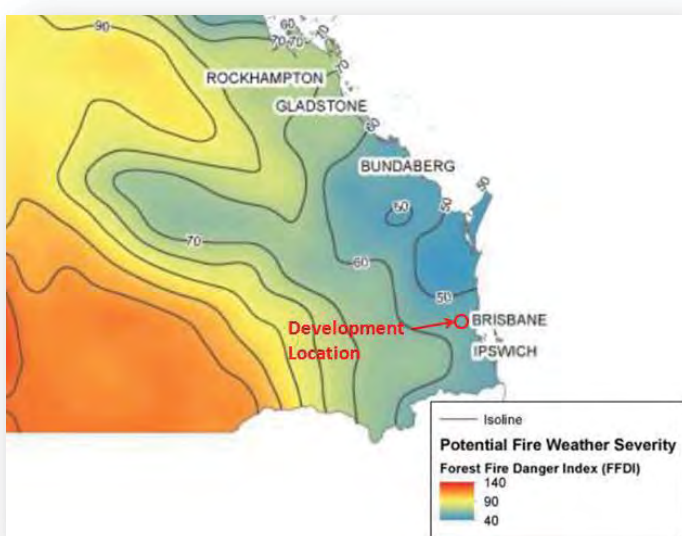
### 5.2 Numbers of people likely to be present

2 - 4 residents could be expected to be present on each of the 127 Lots. The proposed development adds significantly to the number of people living in the area or potentially exposed to the small possibility of unplanned fire. The proposed design, incorporating ample protection areas in and around the Hub serves to protect residents as well as the patrons of the Golf Club.

## 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 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 - 2009).



**Figure 8. State Government revised FDI values to FDI 60 for the area involved. (CSIRO, 2014).**

## 6.2 Anticipated direction of bushfire attack

The probability of unplanned “wildfire” attack is currently regarded as low , although fire could conceivably take hold (after prolonged dry and under worst case fire weather conditions). Section 6.3 models a fire in these areas, as indicated in Figure 4.

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.

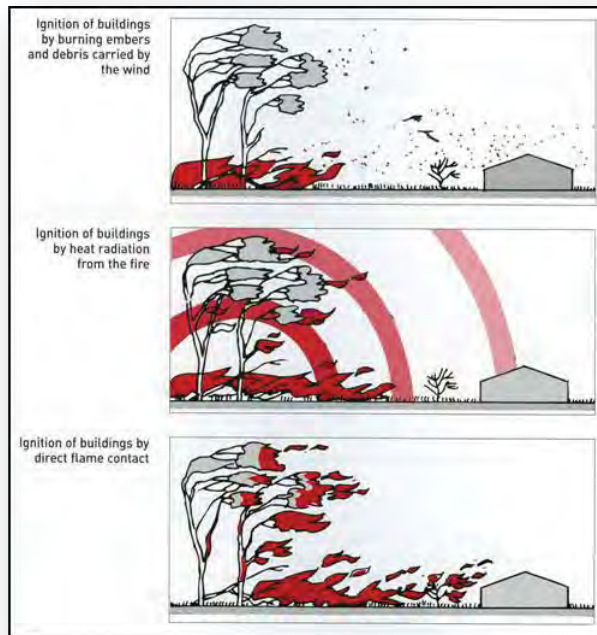


Figure 9. Main Bushfire Attack mechanisms (Image courtesy of Ramsay & Rudolf, 2003)

## 6.3 Anticipated severity of bushfire attack

The anticipated severity of bushfire attack is based on the worst case foreseeable scenarios for the site. The fuel accumulation values used in this assessment are derived from Section 3 and **Appendix 1** of this report and these values are less than those attributed to “forest” in AS3959-2009. In some areas they are also less than the values attributed by CSIRO state wide bushfire hazard mapping, which operates with the top 80<sup>th</sup> percentile value within the broad vegetation group.

Fragmentation of fuel by drainage lines and tracks is likely to reduce actual fire severity below the calculated values in Table 3. However as an argument for minimal setbacks is being presented, it is important to include redundancy within the set of assumptions used.

The potential severity of bushfire will depend on the location and number of ignition points and the fire weather conditions prevailing at the time. Table 3 is based on FDI 60.



Fuel Area	Lots Affected	Fuel Load (S+NS)/ Total	Fuel width (Flame width)	Slope (Degrees/ Orientation)	Fire Line Intensity (FDI 60)	Setback to limit of BAL 29 Method 1	Setback to limit of BAL 29 Method 2	Setback to limit of BAL 19 Method 1	Setback to limit of BAL 19 Method 2	Setback to limit of BAL 12.5 Method 1	Setback to limit of BAL 12.5 Method 2
		t/ha	m	°	kW/m	m	m	m	m	m	m
1	24	14/18	40	6 Down	14 182	20	14	29	18	41	24
2	23	8/14	100	0	4 166	13	7	20	10	28	14
3	17 – 22	8/14	100	7 Down	6 753	20	9	29	14	41	20
4	1-6, 14-17, 77	8/14	100	7 Down	6 753	20	9	29	14	41	20
4	124	8/14	100	0	4166	13	7	20	10	28	14
5	78, 124	10/16	20	3 Down	7 321	16	9	24	12	34	15
6	80 - 87	10/16	30	3 Down	7 321	16	9	24	12	34	17
7	87 - 93	10/16	30	3 Down	7 321	16	9	24	12	34	17
8	94 - 125	10/16	30	3 Down	7 321	16	9	24	12	34	17
9	126	9/14	35	0	4 687	13	7	20	10	28	14
10	Riparian strip beside Hub to be landscaped – Low Hazard State										
11		8/15	To be mown parkland (mown between large mature trees) – Low Hazard State								
12	Golf Course to be landscaped – Low Hazard State										

**Table 3. Calculation of Indicative Setback Requirements for BAL 29 and BAL 19 construction under AS3959-2009, comparing Methods 2 and Method 1.** (Refer to Appendix 1 for fuel accumulation data and assumptions).

Accuracy of both sets of hazard mapping (State and Local Government) is subject to groundtruthing, which Table 3 shows to be of only medium hazard.

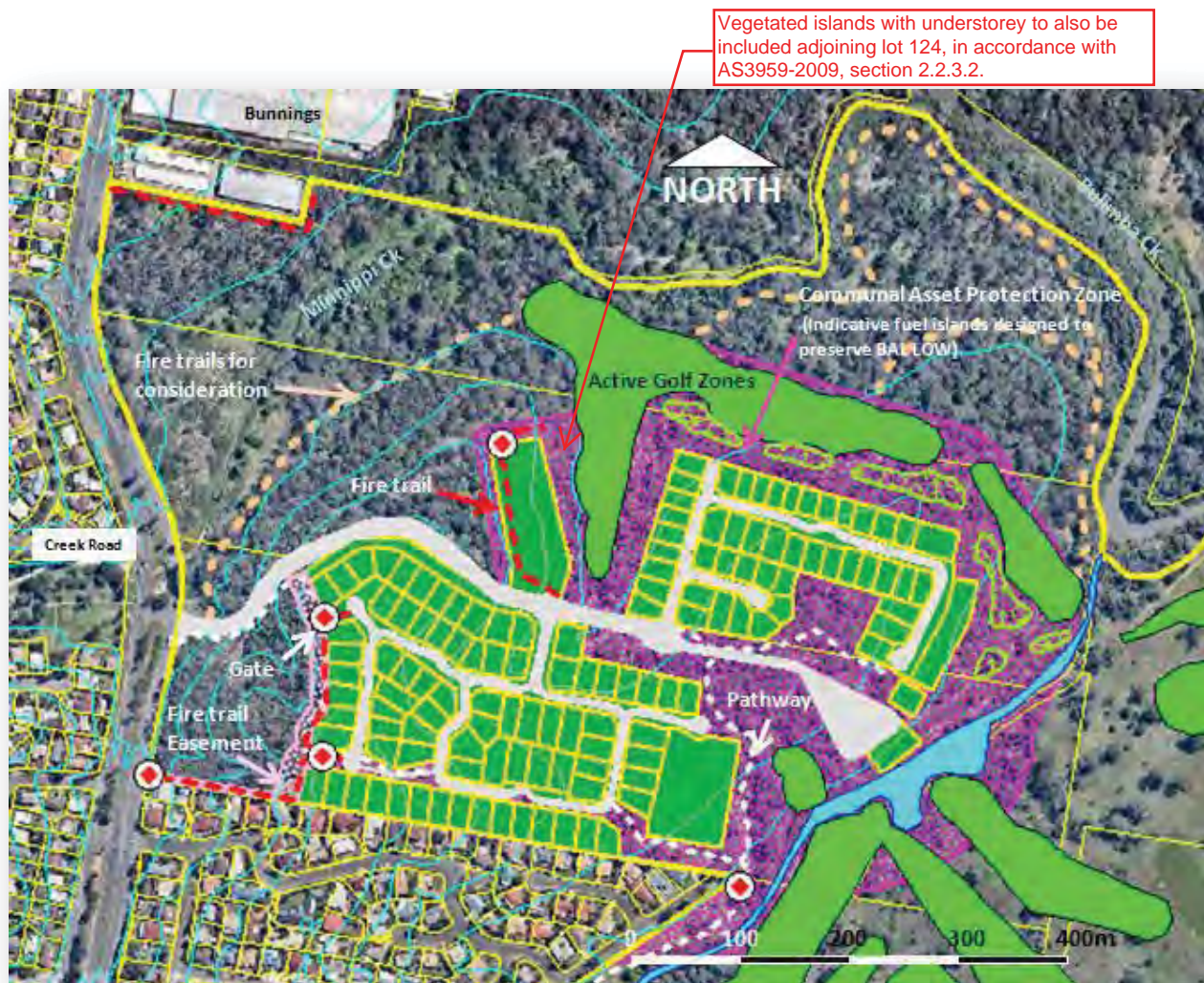
Note there is no Fire Line Intensity above 20kW/m ie. no hazard greater than medium.

Site specific fire modelling by Method 2 under AS3959-2009 demonstrates the viability of generally smaller setbacks than Method 1, despite using a more robust FDI value of 60.

For western Lots adjacent to Fuel Areas 1 - 3, the proposed fire trail protection zone provides 14m of setback, enabling BAL 12.5 construction to be viable provided that construction is avoided in the rear 4m of Lots 17 – 23. The APZ for the fire trail widens out to 20m beside Lot 17 and to 24m beside Lot 24, enabling BAL 12.5 construction to be viable on these Lots. By extending west behind neighbouring houses on Foxmont Drive, some protection is afforded to dwellings that are not constructed in accordance with AS3959.

Retaining unmanaged corridors of vegetation (Fuel Areas 5 – 11) would present difficulties in achieving compliant construction under Councils Bushfire Overlay Code and would generally threaten the community, including the Hub and Golf Course. Table 3 shows the setbacks required from unmanaged vegetation, that are simply not available on the lots themselves.

It is recommended that the Asset Protection Area identified in Figure 10 is constructed and maintained in a park like state, with a mown grassed surface beneath individual trees. In this way it will constitute Low Hazard and serve as an Outer Protection Area for most of the built environment. It will enable residential buildings to be constructed at either BAL - 12.5 or BAL – LOW, and will also provide a safe line – of – sight environment for the community. With open water bodies present this is both a safety and amenity objective.



**Figure 10. Communal Asset Protection Zone and Fire Trail Protection Zones serve to enable compliant construction under Councils Bushfire Overlay Code.**

The significance of these radiant heat flux levels is shown below in Table 4.

Radiant Heat Flux (kW/m <sup>2</sup> )	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 - 2009.
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 - 2009.
19	Screened float glass could fail during the passage of a bushfire. Limit of BAL-19 Construction AS3959 - 2009.
12.5	Standard float glass could fail during the passage of a bushfire. Limit of BAL-12.5 Construction AS3959 - 2009. 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 4. Significance of various RHF levels (Source: NSW RFS, 2006)**

## 7.0 Bushfire Protection Measures in Combination



**Figure 11. Bushfire Planning Measures in Combination (Source: NSW RFS, 2006)**

Figure 11, 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 to provide protection against bushfire.

Simply removing the hazard (bushland) is one possible way of removing risk to life and property, but this approach is hardly 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

Section 6.3 and Figures 12 and 13 show that the construction requirement for any residential building will not need to exceed BAL 12.5 under AS3959-2009.

Any other structure built within 6m of each residence shall be constructed in accordance with this Standard.

Fences constructed at the interface with fire trails shall be non combustible or of hardwood timber.

Figures 12 and 13 show the approximate reach of the relevant BAL ratings for this site, more accurately represented in Appendix 2 (Site Plan Drawing No SK047). The effect of the Communal APZ is to create a Low Hazard and BAL-LOW environment for the core of the site.





**Figure 12. Fire trail protection zone provides for a safer fire trail and sufficient setback for viability of BAL 12.5.**  
(Protection Zone widths noted in metres).



Vegetated islands with understorey to be included adjoining lot 124, in accordance with AS3959-2009, section 2.2.3.2.

Vegetated islands with understorey, in accordance with AS3959-2009, section 2.2.3.2.

Existing vegetation is to be retained along this waterway in the interim, until final assessment as part of future golf course applications/works. Vegetation retained within the identified residential APZ is to be retained in accordance with the definition of low-threat vegetation under AS3959-2009 (section 2.2.3.2).

**Figure 13. Communal Asset Protection Zone affords safety and amenity to the core of the development.**  
(Please refer to the full scale version of Drawing Number SK047).

The fire trail west of Lots 17 to 24 will be located within a Fire Trail Protection Zone ranging from 14 to 24m wide (as shown in Figure 12. This serves to ensure that BAL 19 construction is not required for adjacent dwellings. Trees are retained within the fire trail protection zone as long as they are at least 6m apart.

The fire trail across Lot 124 effectively utilizes the planned access driveway, a minimum of 4m wide, however since it has to be maintained free of obstructions and function as a section of fire trail, it shall be on an easement across this freehold Lot.



## 7.2 Asset Protection Zones and Landscaping

DA Conditions require the proposal to *submit and obtain approval the Delegate, Development Assessment for a Bushfire Management Plan for the reconfiguration.*

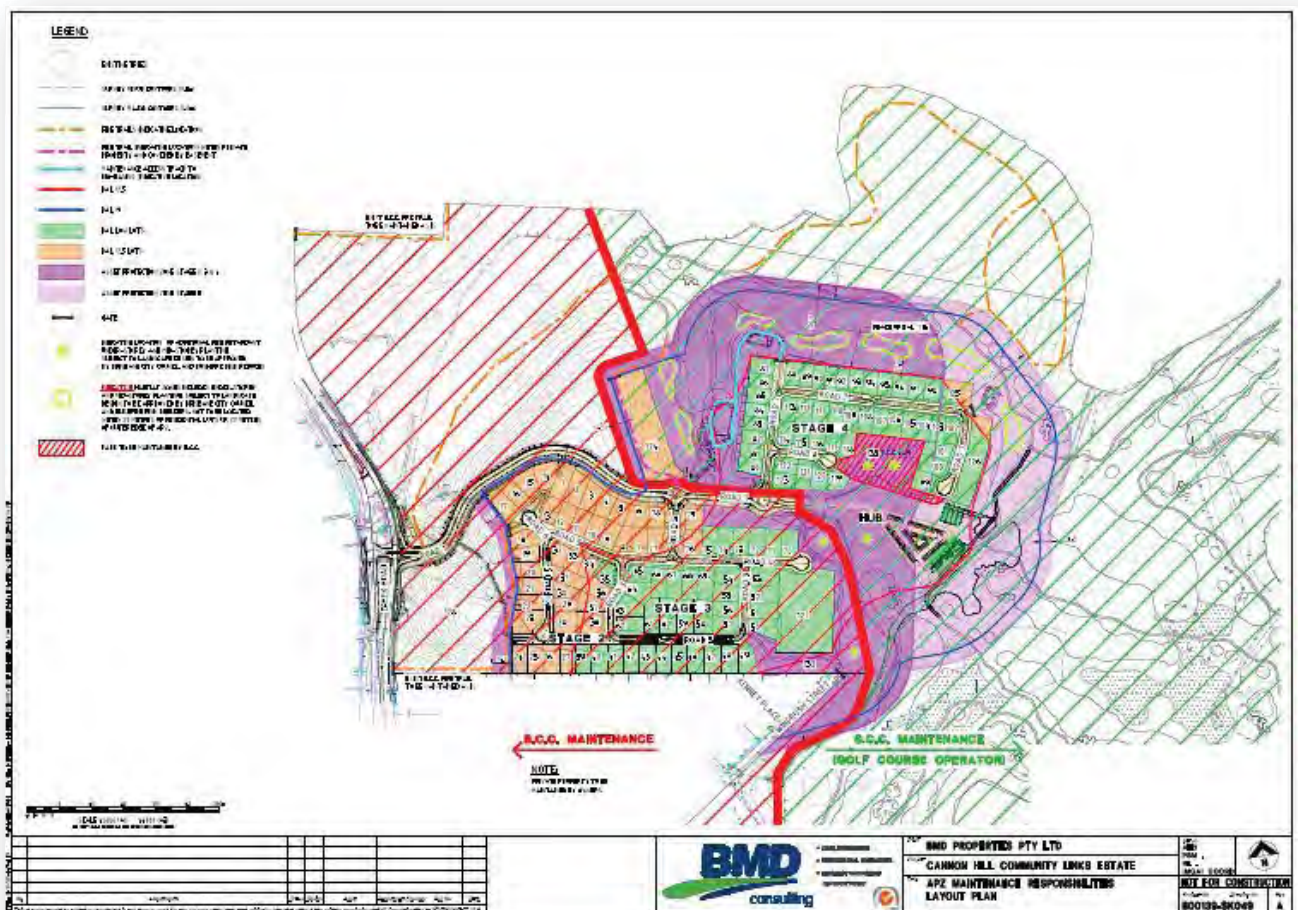
a) *The Bushfire Management Plan is:*

- *To be undertaken in accordance with the requirements of State Planning policy 1/2003;*
- *To specify a strategy for ensuring that any dwellings constructed are not exposed to an unacceptable bushfire hazard; and*
- *The proposed strategy is to **specifically exclude any reliance upon vegetation clearance outside of the boundaries of proposed new lots to achieve acceptable bushfire hazard levels.***

b) *Implement and maintain the Approved Bushfire Management Plan.*

Responding to the third dot point, separation from unmanaged fuel that is provided by roads, managed parkland areas and managed fire trails with their adjacent protection zone all counts as Asset Protection Zone.

Responding to point (b), assigning responsibility for managing parkland areas and fire trails is important to ensure they are *maintained* in a low hazard state. Both the Golf Course Operator and Council have areas where they are responsible for such maintenance. Figure 14 (Drawing Number SK049) shows in red the areas for which Council has maintenance responsibility, and in green the areas which are the responsibility of the Golf Course Operator.



**Figure 14. APZ and Fire Trail Maintenance responsibilities** (Please refer to the full scale version of Drawing Number SK049).



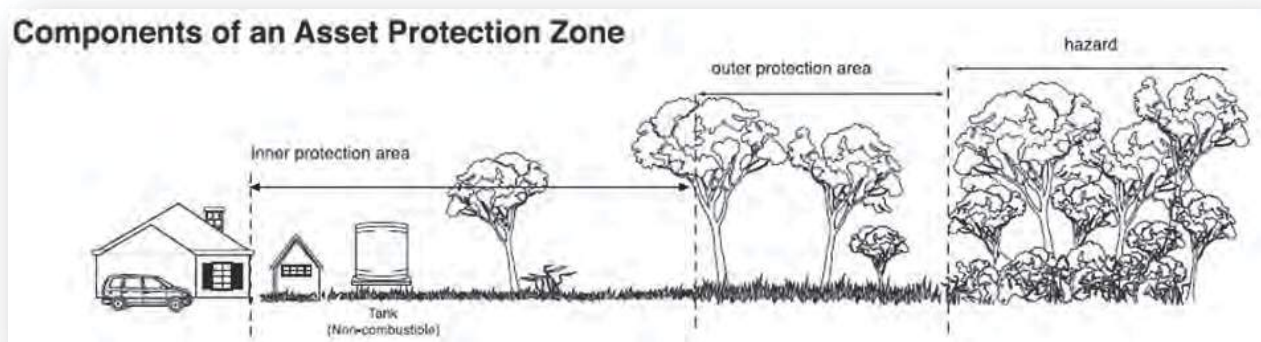
Asset protection zones are the most strategically valuable defence against radiant heat and flame, and to a lesser extent embers.

The landscaping plan shall maintain an “Inner Protection Area” (IPA) for the entire unbuilt area of all Lots, 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 2 provides examples of less hazardous native plant species.
- Combustible vegetation shall not be allowed to come into contact with combustible parts of buildings.
- 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 Communal APZ and the Fire Trail protection zones will be maintained as OPA.

As shown in Figure 13 and 14, indicative design of small habitat islands enables compliance with the exclusions under Section 2.2.3.2 of AS3959-2009, providing ecological value whilst preserving a BAL LOW condition for adjacent Lots.



**Figure 15. Components of an Asset Protection Zone (APZ)**

### **7.2.1 Clearing for successive Stages of proposed development**

In order to avoid subjecting Lot buyers to construction imposts that will not be warranted once successive Stages are developed, APZs will be cleared ahead of each Stage as shown in Figure 16. (Please refer to the full scale version of Drawing Number SK047).



Figure 16. APZ creation ahead of successive Stages of development to preserve BAL LOW condition for as many Lots as possible. (Please refer to the full scale version of Drawing Number SK047).

### 7.3 Access and Egress Management

The site is within approximately 2km by road of the nearest Queensland Fire and Emergency Services (Cannon Hill Fire Station, Corporate Drive).

Whilst the main access is via Creek Road, emergency access is also available via Windrush Street.

The existing road and driveway network provides ready access to all Lots, with the turning circles of 16m diameter. Slightly less than the desired 24m diameter, three point turning space is available that are at least 6m wide and 8m deep to any gates or obstructions.

Access shall be preserved to the rear of all Lots interfacing with bushland, for fire fighters on foot.

Fire trails will be constructed with a minimum formed width of 4m (with gates also providing this clearance), with a minimum vertical clearance of 4m, and clear of available fuel for a minimum width of 6m. Maximum gradient is not to exceed 12.5%, with adequate cross fall and cross drainage to prevent soil erosion and minimise ongoing trail maintenance. The surface rating should be a minimum 6.5t rating for rural off road fire appliances. Areas for vehicles to pass or turn will be provided at intervals of not more than 400m with a maximum grade of 5%. Fire trails will have vehicular access at each end and across Lot 124 will be on an easement granted in favour of BCC and QFES. The exact passage taken by fire trails will be walked and groundtruthed with BCC to minimise impact and to define construction and surface treatments.

## 7.4 Water Supplies and Utilities

Water supply for the development will be connected to Council mains reticulated supply, with hydrants installed with volumes and pressure under the control of Council water utilities provider.

Electricity supply to the site shall be 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 the proposed road and driveways for Emergency Services use.

Obstructions to access onto individual Lots and the rear of buildings should be avoided.

Residents shall be made aware of the existence of this Plan, and their need to comply with the relevant provisions, in particular building construction, APZ maintenance, optimizing access around buildings and emergency response preparations.

Residents shall decide on their Stay and Defend / or Go Early strategy before each fire season so as to ensure this decision is not made too late, when smoke and emergency vehicles prevent an orderly evacuation. Staying to defend is a viable and preferable option for the proposed development.

Residents staying to defend 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.

Appendix 3 provides guidance for Residents' Emergency Management Planning in relation to bushfire.

## 8.0 Assessment of proposal against Brisbane City Plan 2014 (Part 8.2.5 Bushfire Overlay Code, Section C – Reconfiguring a Lot)

Performance Outcomes	Assessment and Acceptable Outcomes
<b>8.1 (PO15)</b> Development addresses the bushfire hazard determined by a site-specific bushfire hazard assessment.	<b>Acceptable Outcome AO15 is applied in that</b> a site-specific bushfire hazard assessment has been prepared in accordance with the Bushfire planning scheme policy which: (i) confirms the level of bushfire hazard for the part of the site which development is proposed; (ii) identifies the location of hazardous vegetation that poses a bushfire risk to the development.
<b>8.2 (PO16)</b> Development does not materially increase the number of premises exposed to unacceptable risk during bushfire events.	<b>Acceptable Outcome AO16 is applied in that</b> Whilst development increases the number of premises, the new property that is created is not exposed to high risk. Protection measures required under this Plan serve to reduce the residual risk of bushfire.  <b>Acceptable Outcome AO2.2 is applied in that</b>



	<p>Development is sited within a building protection zone; and</p> <p>Building construction shall be in accordance with the requirements determined under AS3959-2009.</p>
<p><b>8.3 (PO17)</b></p> <p>Development is designed to:</p> <p>(a) mitigate the risk of bushfire hazard to each lot;</p> <p>(b) limit the spread of bushfire within the reconfiguration;</p> <p>(c) achieve and maintain sufficient separation distance between development and hazardous vegetation to minimise bushfire hazard to future buildings during a bushfire;</p> <p>(d) allow for emergency services access.</p> <p>(e) locate buildings within a building protection zone</p>	<p><b>Acceptable Outcome AO17.1 is applied in that</b></p> <p>Development provides Lots in a number, size, shape and layout which allow for the siting of future buildings:</p> <p>(a) generally within a building protection zone in accordance with Figures b and c of Councils bushfire hazard overlay code</p> <p>(b) to generally achieve separation distances between the development and <u>hazardous</u> vegetation of at least 20m (and where these distances are not achieved it has been demonstrated that the hazard is low enough to achieve an acceptable Bushfire Attack Level rating);</p> <p>(c) shielded from ridgelines and hilltop sites with fuelled slopes;</p> <p>(d) on land with a gradient less than 15%;</p> <p>(e) avoiding long north to west facing fuelled slopes.</p> <p><b>Acceptable Outcome AO17.2 is applied in that</b></p> <p>Development ensures that the bushfire attack level of the development footprint plan does not exceed Bushfire Attack Level 12.5 (calculated in accordance with AS 3959-2009 Construction of buildings in bushfire-prone areas).</p>
<p><b>8.4 (PO18)</b></p> <p>Development promotes safe site access, avoids creating a potential entrapment situation and supports accessibility and manoeuvring for fire fighting during bushfires.</p>	<p><b>Acceptable Outcome AO18 is applied in that</b></p> <p>Development provides a lot layout which:</p> <p>(a) provides direct road access and egress for new lots to public roads, without creating additional easements;</p> <p>(b) whilst the new residential lots are less than 2,500m<sup>2</sup>, the level of hazard has been demonstrated to be moderated ( by lower available fuel levels, less combustible vegetation and sufficient setback to avoid radiant heat flux above 19kW/m<sup>2</sup>);</p> <p>(c) in an urban category, locates future building protection zones to avoid a driveway of longer than 70m from the road frontage to a habitable building</p>
<p><b>8.5 (PO19)</b></p> <p>Development ensures that the road layout and design provides:</p> <p>(a) efficient emergency services access to sites and manoeuvring within the subdivision;</p> <p>(b) safe and efficient movement of residents, workers and visitors out of the subdivision and away from an approaching bushfire;</p> <p>(c) safe and efficient movement of emergency services into the subdivision;</p> <p>(d) alternative egress routes considering the most likely bushfire scenarios;</p> <p>(e) ongoing availability and maintenance of access and egress routes for the purposes of evacuation and emergency services access.</p>	<p><b>Acceptable Outcome AO19.1 is applied in that</b></p> <p>Development involving a new road or fire maintenance trail is designed and constructed in compliance with:</p> <p>(a) Table 8.2.5.3.C; and</p> <p>(b) this bushfire management plan.</p> <p><b>Acceptable Outcome AO19.2 is applied in that</b></p> <p>Development has a road layout and design which:</p> <p>(a) provides for alternative access routes (in a safe direction) by public roads that meet the requirements in Table 8.2.5.3.C and are able to access the arterial road network;</p> <p>(b) involves cul-de-sacs but with additional space at each to improve turning facilities for emergency appliances;</p> <p>(c) does include dead-end roads and culs de sac, although most are less than 60m long and are situated within safe turning locations.</p> <p>(d) provides future emergency access via Windrush Street.</p>
<p><b>8.6 (PO20)</b></p> <p>Development involving new premises provides adequate infrastructure to support fire fighting.</p>	<p><b>Acceptable Outcome AO20.1 is applied in that</b></p> <p>Development involving new premises ensures that:</p> <p>lots have access to reticulated water supply and water pressure available for fire-fighting requirements with water supply and pressure that accord with the standards specified by the relevant utilities provider.</p>

	<p><b>Acceptable Outcome AO20.1 is applied in that</b>  Development provides fire hydrants in accordance with Central SEQ Distributor-Retailer Authority, Queensland Urban Utilities (incorporating Water Services Association of Australia) Standards.</p>
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## 9.0 Assessment of proposal against Single State Planning Policy 2016

Single State Planning Policy (SSPP, December 2013, latest version April 2016) replaces State Planning Policy 1/03 *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*. The SSPP Guideline – Natural Hazards 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 as potentially hazardous and as a bushfire prone area.

Part E of the SSPP provides interim development assessment requirements 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. Specific guidelines for bushfire hazard overlay codes are yet to be provided, and this detail is addressed by this Plan in terms of meeting the current requirements of Local Government in Section 8 above.

Interim Development Assessment Requirements – SSPP Part E	Solutions Provided
<b>Development:</b>	
(1) avoids natural hazard areas or mitigates the risks of the natural hazard, and	This Plan establishes the minor nature 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.
(2) 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.
(3) 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 reduces the nature of the existing hazard, and landscaping on the site is designed to moderate the exposure of buildings, which will also be constructed in accordance with AS3959-2009. The potential for damage to other properties <b>will be decreased</b> as a consequence of the proposed development.
(4) avoids risks to public safety and the environment from the location of hazardous materials and the release of these materials as a result of a natural hazard, and maintains or enhances natural processes and the protective function of landforms and vegetation that can mitigate risks associated with the natural hazard	<p>Hazardous materials are not stored in quantities or locations on the site which would pose a risk to the public or the environment.</p> <p>Natural processes and protective functions of landforms and adjacent vegetation are unaffected by the development or bushfire mitigation measures required by this Plan.</p>
(5) maintains or enhances natural processes and the protective function of landforms and vegetation that can mitigate risks associated with the natural hazard.	The development maintains the natural processes and protective function of vegetation that previously existed for the site.

## 10.0 Recommendations

1. That any new residential building shall be constructed in accordance with Sections 6.3 and 7.1 of this Plan, and with reference to AS3959-2009. The requirement for BAL 12.5 construction is not exceeded for any residential building. Any other structure built within 6m of dwellings shall also be constructed in accordance with this Standard. Builders shall warrant that they have a copy of this Standard, and that it shall be used consistently throughout the design and construction of any residential building or structure built within 6m of the residence.  
Fences constructed at the interface with fire trails shall be non combustible.
2. The Fire Trails described in Sections 6.3 and 7.3 of this Plan shall be maintained by BCC (west of Lots 17 to 24, behind Foxmont Drive, south of Bunnings and within an easement on Lot 124) and by the Golf Course operator elsewhere. **The fire trail easement on lot 124 is to be maintained by the property owner/body corporate.**
3. The Golf Course Operator will maintain the Communal APZ as described in Section 7.2, which preserves a BAL LOW condition for most lots in Stages 3, 4 and 5. The Golf Course Operator will maintain the fire trail protection zone beside the fire trail on Lot 124. BCC will be responsible for maintenance of Park Lots 132 and 133 in a Low Hazard state.
4. Asset Protection Zones shall be established and maintained as IPA for the entire unbuilt portion of each Lot as described in Section 7.2 of this report. This will support construction in accordance with AS3959-2009, and to a maximum of BAL 12.5 as required by AO17.2 of Council's Bushfire Hazard Overlay Code.
5. Lot buyers shall be made aware of the existence of this Plan and their responsibilities outlined within it, in particular construction, asset protection zone and emergency management.
6. This BMP should be reviewed after a (maximum) period of 5 years or immediately following any unplanned bushfire incident, to review its adequacy and accommodate any lessons learnt through adaptive management.

~~7. An easement is to be created over the fire trail on lot 124 in favour of BCC and QFES for access and bushfire management purposes. The trail/easement is to be a minimum formed width of 4m (with gates also providing this clearance), with a minimum vertical clearance of 4m, and clear of available fuel for a minimum of 6m. The maximum gradient is not to exceed 12.5%. See section 7.3 for further details.~~

## 11.0 Summary

The area of "hazard" faced by the proposed development is significant, and the likelihood of wildfire is possible, however fire infrastructure and APZs provide considerable risk mitigation.

Along with adequate water supply and emergency management arrangements, compliant construction under AS3959-2009 and APZs to reduce the exposure of life and property to bushfire, these combined measures assist residents to prepare for the slim possibility of fire in the area.

This Plan demonstrates compliance with legislative requirements of State and Local Government, and the BCA.

7. A 6m wide easement is to be created over the fire trail on lot 124 in favour of BCC and QFES for access and bushfire management purposes. The fire trail is to be a minimum formed/trafficable width of 4m (with gates also providing this clearance), with a minimum vertical clearance of 4m, and clear of available fuel for a minimum of 6m (i.e. 4m wide trail with at least 1m either side of the trail being clear of available fuel). Mown turf and garden beds containing low-combustibility plants/mulch are not considered to be 'available fuel'. The maximum gradient is not to exceed 12.5%. See section 7.3 for further details.



## 12.0 References

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Standards Australia (2005), *AS 2419.1– 2005, Fire hydrant installations – System design, installation and commissioning*, Sydney, NSW.

Standards Australia (2002), *AS 1596 The storage and handling of LP Gas*, Sydney, NSW.

Standards Australia (2009), *AS 3959 – 2009, Construction of buildings in bushfire-prone areas*, Sydney, NSW.

Sustainable Planning Act (2009), Queensland Government, Queensland.

Vegetation Management Act (1999), Queensland Government, Queensland.

Webster, J. (2000), *The Complete Bushfire Safety Book*, Random House Australia, NSW.

## Appendix 1

### Fuel assessments in key areas affecting the site



**Figure 17. Fuel Assessment Areas across the Subject Site**

Sites were selected to understand fuel structures and loadings at interfaces between potentially retained vegetation and future built environment.



## 1. Fuel Accumulation Assessment – Area 1



Figure 18. Fuel Accumulation Assessment – Area 1.

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	High	Moderate litter layer averaging 30mm, with Very high (50% cover) NS grassy fuels.	13 - 14
Elevated	High	Shrubs and recruiters with areas of <i>Parsonsia sp</i>	3
Bark	Moderate	<i>C.intermedia</i> , <i>C.trachyphloia</i> , <i>E. microcorys</i> , <i>E.major</i> , <i>E. siderophloia</i> , <i>E.crebra</i> , <i>Casuarina sp.</i>	1
Overall rating	Moderate to High		17 - 18 t/ha

Table 5. Fuel Assessment Area 1

With more than 20 years since the last fire, current fuel loads are likely to be close to their long term maximum stable state. Section 6 fire modelling for this fuel zone applies a total 18t/ha fuel accumulation, 14t/ha of which is surface/near surface fuel to the interface for Lot 24. This is less than the 35t/ha attributed to “forest” under Method 1 of AS3959-2009.



## 2. Fuel Accumulation Assessment – Area 2



Figure 19. Fuel Accumulation Assessment – Area 2

Fuel hazard estimate		Assessment according to Hines et al 2010	
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Very high litter layer averaging 30mm, as a layer of <i>Casuarina</i> needles, with low aeration, suppressing NS fuels	8
Elevated	Low	Canopy recruiters – Mainly <i>Casuarina</i> sp, with <i>L.confertus</i> and <i>Acacia</i> sp.	2
Bark	Moderate	<i>L.confertus</i> (platy bark), with <i>Casuarina</i> sp and few <i>A.leiocarpa</i>	1
Overall rating	Moderate		12 t/ha

Table 6. Fuel Assessment Area 2

With more than 20 years since the last fire, current fuel loads are likely to be close to their long term maximum stable state. Allowing for potential further recruitment of elevated fuel development Section 6 fire modelling for this fuel zone applies a total 14t/ha fuel accumulation, 8t/ha of which is surface/near surface fuel to the interface for Lot 23. This is less than the 35t/ha attributed to “forest” under Method 1 of AS3959-2009.

### 3. Fuel Accumulation Assessment – Area 3



Figure 20. Fuel Accumulation Assessment – Area 3

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	High litter layer averaging 30 mm, with 10% cover of weak grassy ( <i>Panicum sp</i> ) NS fuels limited by shallow stony soils.	8
Elevated	Low - Moderate	Canopy recruiters with <i>L.confertus</i> and <i>Acacia sp.</i>	2
Bark	Moderate	<i>L.confertus</i> (platy bark), with <i>E.tereticornis</i> (ribbon bark), <i>C. intermedia</i> , <i>Acacia spp</i> and few <i>A.leiocarpa</i>	1 - 2
Overall rating	Moderate		14 t/ha

Table 7. Fuel Assessment Area 3

With more than 20 years since the last fire, current fuel loads are likely to be close to their long term maximum stable state. Section 6 fire modelling for this fuel zone applies a total 14t/ha fuel accumulation, 8t/ha of which is surface/near surface fuel to the interface for Lots 17 - 22. This is less than the 35t/ha attributed to “forest” under Method 1 of AS3959-2009.



#### 4. Fuel Accumulation Assessment – Area 4



Figure 21. Fuel Accumulation Assessment – Area 4

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Variable leaf litter layer averaging 20 - 30 mm, with low (<20%) cover of grasses, suppressed by shading and shallow stony soils.	8
Elevated	Moderate	Few canopy recruiters, patches of woody weeds <i>Lantana sp</i> , <i>Solanum sp</i> , <i>Baccharis sp</i> and areas of <i>Parsonsia sp</i> .	2
Bark	Moderate	<i>L.confertus</i> (platy bark), and <i>Acacia</i> predominate, with few <i>E.tereticornis</i> (ribbon bark), <i>C. intermedia</i> , <i>E. siderophloia</i> , <i>E.major</i> and few <i>A.leiocarpa</i>	1 - 2
Overall rating	Moderate		14 t/ha

Table 8. Fuel Assessment Area 4

With more than 20 years since the last fire, current fuel loads are likely to be close to their long term maximum stable state. Section 6 fire modelling for this fuel zone applies a total 14t/ha fuel accumulation, 8t/ha of which is surface/near surface fuel. This is less than the 35t/ha attributed to “forest” under Method 1 of AS3959-2009.



## 5. Fuel Accumulation Assessment – Area 5



Figure 22. Fuel Accumulation Assessment – Area 5

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Very high leaf litter layer averaging 30 - 40 mm, with low (<20%) cover of grasses, suppressed by shading and shallow stony soils.	10
Elevated	Moderate	Few canopy recruiters, patches of woody weeds <i>Lantana sp</i> , <i>Solanum sp</i> , <i>Baccharis sp</i> and areas of <i>Parsonsia sp</i> .	3 - 4
Bark	Moderate	<i>L.confertus</i> (platy bark), and <i>Acacia</i> predominate, with few <i>E.tereticornis</i> (ribbon bark), <i>C. intermedia</i> , <i>E. siderophloia</i> , <i>E.major</i> and few <i>A.leiocarpa</i>	1 - 2
Overall rating	High		16 t/ha

Table 9. Fuel Assessment Area 5

With more than 20 years since the last fire, current fuel loads are likely to be close to their long term maximum stable state. Section 6 fire modelling for this fuel zone applies a total 16t/ha fuel accumulation, 10t/ha of which is surface/near surface fuel. This is less than the 35t/ha attributed to “forest” under Method 1 of AS3959-2009.

## 6. Fuel Accumulation Assessment – Area 6



**Figure 23. Fuel Accumulation Assessment – Area 6**

Area 6 is currently exclusively comprised of *Acacia spp* and is planned for rehabilitation works in an area between the 7<sup>th</sup> Hole of the golf course and residential Lots. For the purposes of Section 6 fire modelling, similar fuel values to Area 4 may be applied with a total 16t/ha fuel accumulation, 10t/ha of which is surface/near surface fuel, if the area was left unmanaged.

From both a safety and amenity perspective, it is recommended that this area is managed in a parklike state with a mown grassy surface. As such it will form an Asset Protection Zone (APZ) managed as Outer Protection Area (OPA – refer to Section 7.2) behind residential Lots, and avoid the need for elevated construction requirements under AS3959-2009.



## 7. Fuel Accumulation Assessment – Area 7



Figure 24. Fuel Accumulation Assessment – Area 7

Fuel hazard estimate		Assessment according to Hines et al 2010	
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	High leaf litter layer averaging 30mm, with 20% cover of grasses, suppressed by shading.	10
Elevated	Moderate	Few canopy recruiters, patches of woody weeds <i>Lantana sp</i> , <i>Solanum sp</i> , <i>Senna sp</i> , <i>Tecoma sp</i> and areas of <i>Parsonsia sp</i> and <i>Asparagus sp</i> .	3 - 4
Bark	Moderate	<i>E.tereticornis</i> (ribbon bark) with <i>L.confertus</i> and <i>L.suavolens</i> (platy bark), and <i>Acacia spp</i> with few <i>E.racemosa</i>	2
Overall rating	High		16 t/ha

Table 10. Fuel Assessment Area 7

Area 7 is between the 8<sup>th</sup> Hole of the golf course and residential Lots. For the purposes of Section 6 fire modelling, similar fuel values to Area 5 may be applied with a total 16t/ha fuel accumulation, 10t/ha of which is surface/near surface fuel, if the area was left unmanaged.

From both a safety and amenity perspective, it is recommended that this area is managed in a parklike state with a mown grassy surface. As such it will form an Asset Protection Zone (APZ) managed as Outer Protection Area (OPA – refer to Section 7.2) behind residential Lots, and avoid the need for elevated construction requirements under AS3959-2009.



## 8. Fuel Accumulation Assessment – Area 8



**Figure 25. Fuel Accumulation Assessment – Area 8**

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	High leaf litter layer averaging 30mm, with 20 - 30% cover of grasses, suppressed by shading.	10
Elevated	Moderate	Few canopy recruiters, mainly woody weeds <i>Lantana sp</i> , <i>Ochna sp</i> and areas of <i>Parsonsia sp</i> .	3 - 4
Bark	Moderate	<i>L.confertus</i> (platy bark), and <i>Acacia spp</i> with few <i>C.intermedia</i> and <i>E.tereticornis</i> .	2
<b>Overall rating</b>	<b>High</b>		<b>16 t/ha</b>

**Table 11. Fuel Assessment Area 8**

Area 8 is between the 8<sup>th</sup> Hole of the golf course and residential Lots. For the purposes of Section 6 fire modelling, a total 16t/ha fuel accumulation, 10t/ha of which is surface/near surface fuel, if the area was left unmanaged.

From both a safety and amenity perspective, it is recommended that this area is managed in a parklike state with a mown grassy surface. As such it will form an Asset Protection Zone (APZ) managed as Outer Protection Area (OPA – refer to Section 7.2) behind residential Lots, and avoid the need for elevated construction requirements under AS3959-2009.

## 9. Fuel Accumulation Assessment – Area 9



Figure 26. Fuel Accumulation Assessment – Area 9

Fuel hazard estimate	Assessment according to Hines et al 2010		
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate leaf litter layer averaging 20mm, with 20% cover of grasses, suppressed by shading.	8 - 9
Elevated	Moderate	Few canopy recruiters, mainly woody weeds <i>Lantana sp</i> and areas of <i>Parsonsia sp</i> .	3 - 4
Bark	Moderate	80% <i>Acacia spp</i> with <i>L.confertus</i> and <i>L.suavolens</i> (platy bark), and invaders of Cadagi ( <i>C.torelliana</i> ) and <i>Camphorum sp</i> .	1
Overall rating	Moderate		14 t/ha

Table 12. Fuel Assessment Area 9

Area 9 is currently mainly comprised of *Acacia spp* in an area between the 8<sup>th</sup> Hole of the golf course and residential Lots. For the purposes of Section 6 fire modelling, a total 14t/ha fuel accumulation, 9t/ha of which is surface/near surface fuel may be applied if the area was left unmanaged.

From both a safety and amenity perspective, it is recommended that this area is managed in a parklike state with a mown grassy surface. As such it will form an Asset Protection Zone (APZ) managed as Outer Protection Area (OPA – refer to Section 7.2) behind residential Lots, and avoid the need for elevated construction requirements under AS3959-2009.



## 10. Fuel Accumulation Assessment – Area 10



**Figure 27. Fuel Accumulation Assessment – Area 10**

Vegetation along this drainage line consists of a limited number of tall eucalypts with dense areas of *Casuarina*, invaded by a range of weed species, be they trees (Cadagi – *Corymbia torreliana*, African Tulip – *Spathodea campanulata*, Camphor Laurel – *Cinnamomum camphorum*), woody weeds (*Lantana camara*, *Solanum spp*, *Baccharis sp*) vines (*Asparagus spp*, *Ipomoea spp*) and others.

It is anticipated that besides the removal of weed species, safety and amenity objectives will result in the area being managed in a parklike state with a mown grassy surface. Direct line - of- sight will be preserved to mitigate drowning hazards for small children. Managed as Asset Protection Zone /Outer Protection Area (OPA – refer to Section 7.2) behind Hub buildings, exposure of these assets to fire can be avoided.



## 11. Fuel Accumulation Assessment – Area 11



Figure 28. Fuel Accumulation Assessment – Area 11

Fuel hazard estimate		Assessment according to Hines et al 2010	
Date: 20 <sup>th</sup> October 2015			
Layer	Rating	Description / Comments	Equivalent fuel load t/ha
Surface and near surface	Moderate	Moderate leaf litter layer averaging 20mm, with 20% cover of grasses, suppressed by shading.	8
Elevated	Moderate	Few canopy recruiters, mainly woody weeds <i>Lantana sp</i> and areas of <i>Parsonsia sp</i> , <i>Asparagus sp</i> .	3 - 4
Bark	Moderate to High	Mainly <i>Acacia spp</i> with several large <i>L.confertus</i> . Isolated <i>E.acmenoides</i> , <i>E. tereticornis</i> , <i>A. leiocarpa</i> , <i>M.quinervia</i> .	1 - 2
Overall rating	High		15 t/ha

Table 13. Fuel Assessment Area 11

For the purposes of Section 6 fire modelling, a total 15t/ha fuel accumulation, 8t/ha of which is surface/near surface fuel may be applied if the area was left unmanaged.

From both a safety and amenity perspective, it is recommended that this area is managed in a parklike state with a mown grassy surface. As such it will form an Asset Protection Zone (APZ) managed as Outer Protection Area (OPA – refer to Section 7.2) behind residential Lots, and avoid the need for elevated construction requirements under AS3959-2009.

## 12. Fuel Accumulation Assessment – Area 12



**Figure 29. Fuel Accumulation Assessment – Area 12**

Area 12 refers to the general environs of the Golf Course which is expected to be landscaped and maintained in a Low Hazard state.



APPENDIX 10

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 houses; 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				
<b>Zamaceae</b>				
<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
<b>Agavaceae</b>				
<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				
<b>Amaryllidaceae</b>				
<i>Critium 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
<b>Araceae</b>				
<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
<b>Arecaceae</b>				
<i>Livistona monostachya</i>	Walking Stick Palm	P	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Commelinaceae</b>				
<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>Pollia crispata</i>	Snake Weed	H Gc	Lm	Us Sa
<i>Pollia macrophylla</i>	Large Snake Weed	H Gc	Lm	Us Sa
<b>Dioscoreaceae</b>				
<i>Dioscorea transversa</i>	Native Yam	V	Lm	Us Sa
<b>Liliaceae</b>				
<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
<b>Orchidaceae</b>				
<i>Dendrobium gracilicaule</i>	Spotted Orchid	eO	Lm	Sa
<i>Dendrobium X gracilimum</i>	Natural Hybrid	eO	Lm	Sa
<i>Dendrobium monophyllum</i>	Lily of the Valley			
	Orchid	eO	Lm	Sa
<i>Dendrobium schoenitium</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
<b>Philesiaceae</b>				
<i>Eustrephus latifolius</i>	Wombat Berry	V	Lm	Us Oa Sa
<i>Geltonoplesium cymosum</i>	Scrambling Lily	V	Lm	Us Sa
<b>Phylodactylaceae</b>				
<i>Phylodactylus lanuginosum</i>	Frogsmouth	aH	Lm SI	Oa Wet areas
<b>Smilacaceae</b>				
<i>Smilax glycyphylla</i>	Sweet Sarsparilla	V	Lm	Us Sa
<b>Xanthorrhoeaceae</b>				
<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
<b>Zingiberaceae</b>				
<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
<b>DICOTYLEDONS</b>				
<b>Aizoaceae</b>				
<i>Carpobrotus glaucescens</i>	Pig Face	H Gc	Lm Sl	Oa
<b>Acanthaceae</b>				
<i>Gratiophyllum excelsum</i> (-)	Scarlet Fuchsia	S		Us Sa
<i>Gratiophyllum spinigerum</i>	Sanford Holly	S		Us Sa
<i>Pseuderanthemum tenellum</i>	Pseuderanthemum	H		Us Sa
<i>Pseuderanthemum variabile</i>	Love Flower	H		Us Sa
<b>Apiaceae</b>				
<i>Centella australis</i>	Pennywort	H Gc		Oa
<i>Hydrocotyle acutiloba</i>	Pennywort	H Gc		Us Sa
<i>Hydrocotyle pedicellata</i>	Pennywort	H Gc		Us Sa
<b>Apocynaceae</b>				
<i>Alyxia ruscifolia</i>	Chain fruit	S		Us Sa
<i>Carissa ovata</i>	Current Bush	S		Us Oa Sa
<i>Neisosperma poweri</i> (-)	Milkbush	S		Us Sa
<i>Ochrostia moorei</i> (-)	Southern Ochrosia	S		Us Sa
<i>Parsonsia lenticellata</i>	Narrow-leaf Silkpod	V		Us Sa
<i>Parsonsia lilacina</i>	Delicate Silkpod	V		Us Sa
<i>Tabernaemontana pandataqui</i>	Banana Bush	S		Us Sa
<b>Aristolochiaceae</b>				
<i>Aristolochia</i> sp. aff. <i>pubera</i>	Pipe Vine	V		Us Sa
<i>Aristolochia praevenosa</i>	Richmond Birdwing Vine	V		Us Sa
<b>Asclepiadaceae</b>				
<i>Hoya australis</i>	Wax Flower	V		Us Sa
<i>Marsdenia longiloba</i>	Slender Milk Vine	V		Us Sa
<i>Secamone elliptica</i>	Corky Milk Vine	V		Us Sa
<i>Tylophora paniculata</i>	Thin-leaf Tylophora	V		Us Sa
<b>Bigoniaceae</b>				
<i>Pandorea floribunda</i>	New sp. Pine R	V		Us Oa Sa
<i>Pandorea jasminoides</i>	Bower of Beauty	V		Us Oa Sa
<b>Caesalpiniaceae</b>				
<i>Cassia artemisioides</i> (-)	Silver Cassia	S		Oa
<b>Campanulaceae</b>				
<i>Lobelia trigonocaulis</i>	Forest Lobelia	H Gc		Us Oa
<i>Wahlenbergia gracilis</i>	Bluebells	H		Oa
<b>Capparidaceae</b>				
<i>Capparis arborea</i>	Native Caper	S/T		Us Sa
<i>Capparis sarmentosa</i>	Scrambling Caper	V		Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Celastraceae</b>				
<i>Cassine australis</i>	Red Olive Berry	S/T		Us Sa
<i>Denhamia celastroides</i>	Orange Boxwood	S/T		Us Sa
<i>Denhamia pittosporoides</i>	Orange Boxwood	S/T		Us Sa
<i>Maytenus bilocularis</i>	Orangebark	S/T		Us Sa
<b>Chenopodiaceae</b>				
<i>Eriodictyon hastata</i>	Berry Salt Bush	S Gc	Sl	Oa
<i>Enchylaena tomentosa</i>	Ruby Salt Bush	S Gc	Sl	Oa
<i>Halosarcia indica</i>	Samphire	S Gc	Sl	Oa Salty soil
<i>Sarcocornia quinqueflora</i>	Samphire	S Gc	Sl	Oa Salty soil
<i>Suaeda australis</i>	Seablite	S Gc	Sl	Oa Salty soil
<i>Suaeda arbusculoides</i>	Jellybean Plant	S Gc	Sl	Oa Salty soil
<b>Convolvulaceae</b>				
<i>Convolvulus erubescens</i>	Australian Bindweed	V		Oa
<i>Dichondra repens</i>	Kidney Weed	H Gc		Us Sa
<i>Polymnia calycina</i>	Swamp Bindweed	V		Oa
<b>Cunoniaceae</b>				
<i>Aphanopetalum resinosum</i>	Gum Vine	V Gc		Us Sa
<i>Vesselowskyia rubifolia</i> (-)	Southern Marara	S/T		Us Sa
<b>Davidsoniaceae</b>				
<i>Davidsonia pruriens</i> (-)	Davidson's Plum	T		Us Sa
<b>Dilleniaceae</b>				
<i>Hibbertia aspera</i>	Rough Guinea Flower	S		Oa
<i>Hibbertia dentata</i>	Toothed Guinea Flower	V		Us Oa Sa
<i>Hibbertia linearis</i>	Showy Guinea Flower	S		Oa
<i>Hibbertia obtusifolia</i>	Hoary Guinea Flower	S		Oa
<i>Hibbertia stricta</i>	Erect Guinea Flower	S		Oa
<i>Hibbertia scandens</i>	Twining Guinea Flower	V		Us Oa Sa
<b>Elaeocarpaceae</b>				
<i>Elaeocarpus reticulatus</i>	Blueberry Ash	S/T		Us Oa Sa
<b>Epacridaceae</b>				
<i>Trochocarpa laurina</i>	Tree Heath	S/T		Us Sa
<b>Escalloniaceae</b>				
<i>Abrophyllum ornans</i>	Native Hydrangea	S		Us Sa
<i>Polysma cunninghamii</i>	Featherwood	S/T		Us Sa
<b>Euphorbiaceae</b>				
<i>Acalypha capillipes</i>	Small-leaf Acalypha	S		Us Sa
<i>Acalypha eremorum</i>	Native Acalypha	S		Us Sa
<i>Acalypha nemorum</i>	Southern Acalypha	S		Us Sa
<i>Actephila lindleyi</i>	Actephila	S/T		Us Sa
<i>Alchornea ilicifolia</i>	Native Holly	S		Us Sa
<i>Breynia oblongifolia</i>	Native Coffee Bush	S		Us Oa Sa
<i>Cleistanthes cunninghamii</i>	Cleistanthes	S/T		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 Casuarilla	S/T	Lm	Us Sa
<i>Macaranga tanarius</i>	Macaranga	S/T	Lm	Us
<i>Mallotus elaeagnoides</i>	Scrub Odour Bush	S/T	Lm	Us Sa
<i>Oncanthe nutans</i> ( <i>O. populifolius</i> )	Old Bleeding Heart	S/T	Lm	Us Sa
<b>Eupomatiaceae</b>				
<i>Eupomatia bennettii</i>	Small Bolwarra	S	Lm	Us Sa
<i>Eupomatia laurina</i>	Bolwarra	S	Lm	Us Sa
<b>Escalloniaceae</b>				
<i>Cutisia viburnea</i> (-)	Native Elderberry	T	Lm	Us Sa
<b>Fabaceae</b>				
<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 tonnentella</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
<b>Goodeniaceae</b>				
<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
<b>Lamiaceae</b>				
<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
<b>Lauraceae</b>				
<i>Cryptocarya laevigata</i>	Glossy Laurel	S/T	Lm	Us Sa
<i>Cryptocarya meisneriana</i>	Thick-leaf Laurel	S/T	Lm	Us Sa
<b>Leeaceae</b>				
<i>Leea indica</i> (-)	Bandicoot Berry	S	Lm	Us Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Lythraceae</b>				
<i>Lagerstroemia archeriana</i> (-)	Native Crepe Myrtle	S/T	Lm	Us Oa Sa De
<b>Malvaceae</b>				
<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
<b>Melastomaceae</b>				
<i>Melastoma affine</i>	Pink Lasiandra	S	Lm	Us Sa Oa
<b>Meliaceae</b>				
<i>Turraea pubescens</i> ( <i>brownii</i> )	Native Witch-Hazel	S/T	Lm	Us Sa
<b>Menispermaceae</b>				
<i>Pleogyne australis</i>	Pleogyne	V	Lm	Us Sa
<b>Mimosaceae</b>				
<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 loveliae</i> (-)	Baconwood	S/T	Lm	Us Sa
<b>Monimiaceae</b>				
<i>Wilkiea huegeliana</i>	Tetra Beech	S/T	Lm	Us Sa
<i>Wilkiea macrophylla</i>	Large-leaf Wilkiea	S/T	Lm	Us Sa
<b>Myoporaceae</b>				
<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
<b>Myrsinaceae</b>				
<i>Aegiceras corniculatum</i>	Milky Mangrove	S/T	Lm St	Oa Coastl
<i>Rapanea howittiana</i>	Scrub Muttonwood	S/T	Lm	Us Sa
<i>Rapanea subsessilis</i>	Red Muttonwood	S/T	Lm	Us Sa
<b>Myrtaceae</b>				
<i>Archirhodomyrtus beckleri</i> (-)	Rose Myrtle	S	Lm	Us Sa
<i>Anstronyrtus fragrantissima</i> (-)	Sweet Myrtle	T	Lm	Us Sa
<i>Anstronyrtus hillii</i>	Scaly Myrtle	S/T	Lm	Us Sa
<i>Anstronyrtus inophloia</i>	Thread-bark Myrtle	S/T	Lm	Us Sa
<i>Anstronyrtus aff. lasioclada</i> (-)	Velvet Myrtle	T	Lm	Us Sa
<i>Anstronyrtus 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>Rhodanthe dumicola</i>	Rib-fruit Malletwood	S/T	Lm	Us Sa
<i>Rhodanthe 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
<b>Nyctaginaceae</b>				
<i>Pisonia aculeata</i>	Native Bougainvillea	V	Lm	Us Sa
<b>Oleaceae</b>				
<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
<b>Passifloraceae</b>				
<i>Passiflora aurantia</i>	Red Passion Flower	V	Lm	Us Oa Sa
<i>Passiflora herbertiana</i>	Yellow Passion Flower	V	Lm	Us Oa Sa
<b>Peperoniaceae</b>				
<i>Peperomia blanda</i> ( <i>leptostachya</i> )	Native Peperomia	H	Lm	Us Sa
<i>Peperomia tetraphylla</i>	Native Peperomia	H	Lm	Us Sa
<b>Pittosporaceae</b>				
<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 Ss/Oa
<b>Proteaceae</b>				
<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 angustifolia</i> (-)		S		Oa Pf
<b>Rhizophoraceae</b>				
<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
<b>Rosaceae</b>				
<i>Rubus parvifolia</i>	Pink Raspberry	S	Lm	Oa
<i>Rubus rosifolius</i>	Native Raspberry	S	Lm	Us Sa
<b>Rubiaceae</b>				
<i>Canthium caprosoides</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 Coffee-wood	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
<b>Rutaceae</b>				
<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>Phebalum woombie</i> (-)	Phebalum	S	Lm	Oa
<b>Sambucaceae</b>				
<i>Sambucus australasica</i>	Yellow Elderberry	S	Lm	Us Sa
<b>Sapindaceae</b>				
<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
<b>Sapotaceae</b>				
<i>Planchonella myrsinoides</i>	Yellow Plumwood	S/T	Lm	Us Sa
<b>Scrophulariaceae</b>				
<i>Artemesia fimbriatum</i>	Koala bells	H	Lm	Oa
<b>Tetragoniaceae</b>				
<i>Tetragonia tetragonioides</i>	Native Spinach	H Gc	St Sc	Oa
<b>Solanaceae</b>				
<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
<b>Sterculiaceae</b>				
<i>Brachychiton bidwillii</i>	Little Kurrajong	S	Lm	Us Sa Oa
<i>Commersonia fraseri</i>	Scrub Kurrajong	S	Lm	Us Sa Oa
<b>Symplocaceae</b>				
<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
<b>MONOCOTYLEDONS</b>				
<b>Arecaceae</b>				
<i>Archontophoenix cunninghamii</i>	Picabeen Palm	P	Im	Ad
<i>Calamus muelleri</i>	Lawyer Cane Vine	P	Im	Ad
<i>Livistona australis</i>	Cabbage Palm	P	Im	Ad
<b>Smilacaceae</b>				
<i>Ripogonum javeticianum</i>	Small Supplejack	V	Im	Sa
<i>Smilax australis</i>	Barb-wire Vine	V	Im	Sa Oa
<b>DICOTYLEDONS</b>				
<b>Akaniaceae</b>				
<i>Akania lucens</i>	Turnipwood	T	Im	Us
<b>Alangiaceae</b>				
<i>Alangium villosum</i>	Muskwood	T	Im	Us
<i>polyosmoides</i>	Muskwood	T	Im	Us
<i>Alangium villosum</i>	Muskwood	T	Im	Us
<b>Annonaceae</b>				
<i>Polyalthia nitidissima</i>	Canary Beech	T	Im	Us
<b>Apocynaceae</b>				
<i>Astonia constricta</i>	Quinine Tree	T	Im	Us
<i>Melodinus acutiflorus</i>	Merangarra	V	Im	Sa
<i>Melodinus australis</i>	Southern Melodinus	V	Im	Sa
<b>Araliaceae</b>				
<i>Cephalorhiza cephalobotrys</i>	Climbing Panax	V	Im	Sa
<b>Bignoniaceae</b>				
<i>Pandorea pandorana</i>	Wonga Vine	V	Im	Oa Sa
<b>Caesalpiniaceae</b>				
<i>Barklya syringifolia</i>	Crown of Gold Tree	T	Im	Us Sa Oa
<i>Cassia tomentella</i> (-)	Velvet Bean	S/T	Im	Us Oa
<b>Canoniaceae</b>				
<i>Callicoma serratifolia</i> (-)	White Alder	S/T	Im	Us
<b>Dilleniaceae</b>				
<i>Tecomathe hillii</i> (-)	Fraser Island Climber	V	Im	Sa

## APPENDICES

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

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Ebenaceae</b>				
<i>Diospyros australis</i>	Black Plum	T	Im	Us/Wb
<i>Diospyros geninata</i>	Scaly Ebony	T	Im	Us/Wb
<i>Diospyros mabacea</i> (-)	Red-fruited Ebony	T	Im	Us
<b>Escalloniaceae</b>				
<i>Anopterus macleayanus</i> (-)	Queensland Laurel	T	Im	Us
<i>Polyalthia nitidissima</i>	Canary Beech	T	Im	Us
<b>Euphorbiaceae</b>				
<i>Claoxylon australe</i>	Brittlewood	S/T	Im	Us
<i>Croton achrophylioides</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
<b>Fabaceae</b>				
<i>Erythrina vespertilio</i>	Bat's Wing Coral Tree	T	Im	Ad De
<b>Hernandiaceae</b>				
<i>Hernandia bivalvis</i>	Cudgerie	T	Im	Wb
<b>Lauraceae</b>				
<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
<b>Meliaceae</b>				
<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> (T. brownii)	Native Witch-Hazel	T	Im	Us
<b>Menispermaceae</b>				
<i>Stephania japonica</i> var. <i>discolor</i>	Tape Vine	V	Im	Sa Oa
<b>Mimosaceae</b>				
<i>Acacia aulucocarpa</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 pruinosum</i>	Snowwood	T	Im	Us/Wb
<b>Moraceae</b>				
<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>Scheblus brunonianus</i> (S. pendulatus)	Whalebone Tree	T	Im	Us/Wb

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Myoporaceae</b>				
<i>Myoporum acuminatum</i>	Coast Boobialla	S/T	Im	Wb Oa
<b>Myrsinaceae</b>				
<i>Rapanea variabilis</i>	Muttonwood	T	Im	Us
<b>Myrtaceae</b>				
<i>Acmena smithii</i> (small varieties)	Creek Lilly Pilly	T	Im	Us/Wb
<i>Decaspermum humile</i>	Silky Myrtle	S/T	Im	Us
<i>Metrosideros queenslandica</i> (-)	Pink Myrtle	T	Im	Us
<i>Rhodamnia rubescens</i>	Brown Malletwood	T	Im	Us/Wb
<i>Syzygium hodgkinsonia</i> (-)	Smooth-bark Rose Apple	T	Im	Us
<b>Oleaceae</b>				
<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
<b>Pittosporaceae</b>				
<i>Hymenosporum flavum</i>	Native Frangipani	T	Im	Us Ad
<i>Pittosporum undulatum</i>	Mock Orange	T	Im	Us/Wb
<b>Proteaceae</b>				
<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
<b>Rubiaceae</b>				
<i>Coelospermum paniculatum</i>	Coelospermum	V	Im	Sa
<i>Hodgkinsonia ovatiflora</i>	Golden Ash	T	Im	Us/Wb
<b>Rununculaceae</b>				
<i>Clematis glycinoides</i>	Headache Vine	V	Im	Sa
<b>Rutaceae</b>				
<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
<b>Sapindaceae</b>				
<i>Alectryon connatus</i>	Alectryon	T	Im	Wb Slow at first
<i>Alectryon subcinerus</i>	Wild Quince	T	Im	Wb
<i>Alectryon subdentatus</i>	Holly-leaf Bird's Eye	T	Im	Wb
<i>Alectryon tomentosus</i>	Hairy Bird's Eye	T	Im	Wb
<i>Arytera discylis</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 tonnetella</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
<b>Sapotaceae</b>				
<i>Planchonella chartacea</i>	Thin-leaf Plum	S/T	Lm	Us Sa
<i>Planchonella cotinifolia</i>	Small-leaf Plum	S/T	Lm	Us Sa
<b>Simaroubaceae</b>				
<i>Guilfoylia monostylis</i>	Native Plum	T	Lm	Us
<b>Symplocaceae</b>				
<i>Symphlocus thwaitesii</i>	Buff Hazelwood	S/T	Lm	Us
<b>PTERIDOPHYTES</b>				
<b>Cyatheaaceae</b>				
<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
<b>GYMNOSPERMS</b>				
<b>Araucariaceae</b>				
<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
<b>Podocarpaceae</b>				
<i>Podocarpus elatus</i>	Brown or Plum Pine	T	Lm	Pf - resin
<b>MONOCOTYLEDONS</b>				
<b>Araceae (Palmae)</b>				
<i>Calamus muelleri</i>	Lawyer Cane Vine	V	Lm	Sa Oa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Flagellariaceae</b>				
<i>Flagellaria indica</i>	Supplejack	V	Lm	Sa
<b>Pandanaceae</b>				
<i>Freylinetia excelsa</i>	Climbing Pandanus	V	Lm	Sa
<i>Freylinetia scandens</i>	Climbing Pandanus	V	Lm	Sa
<b>Smilacaceae</b>				
<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
<b>DICOTYLEDONS</b>				
<b>Anacardiaceae</b>				
<i>Euroschinus falcata</i>	Ribbonwood	T	Lm	Wb
<i>Rhodospaera rhodanthema</i>	Deep Yellowwood	T	Lm	Wb
<b>Annonaceae</b>				
<i>Melodorum leichhardtii</i> (Rauvenhoffia L.)	Zig-Zag Vine	V	Lm	Sa
<b>Apocynaceae</b>				
<i>Astonia 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
<b>Araceae</b>				
<i>Calamus muelleri</i>	Lawyer Cane	V	Lm	Sa
<b>Araliaceae</b>				
<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
<b>Asclepiadaceae</b>				
<i>Marsdenia rastrata</i>	Common Milk Vine	V	Lm	Ad Oa Sa
<b>Atherospermataceae</b>				
<i>Daphandra micrantha</i>	Socketwood	T	Lm	Wb



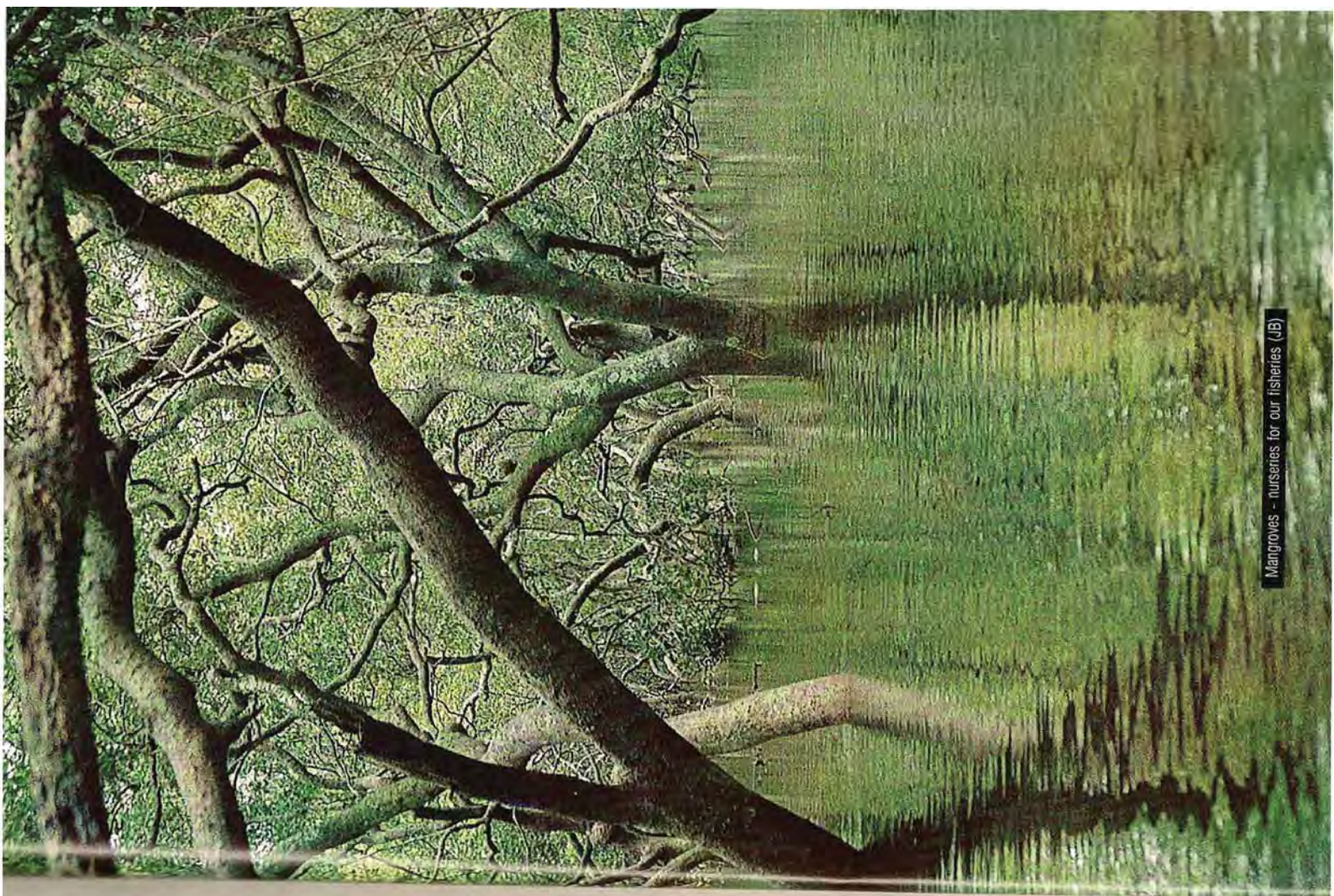
Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Avicenniaceae</b>				
<i>Avicennia marina</i>	Grey Mangrove	T	Ln St	Oa Coastal
<b>Burseraceae</b>				
<i>Canarium australasicum</i>	Carrotwood	T	Ln	Wb
<b>Caesalpinhiaceae</b>				
<i>Cassia murikiana</i> (-)	Native Laburnum	T	Ln	Wb
<i>Caesalpinia boniniae</i>	Caesalpinia	V	Ln	Sa
<i>Caesalpinia scortechinii</i>	Large Prickle Vine	V	Ln	Sa
<i>Caesalpinia subspicata</i>	Corky Prickle Vine	V	Ln	Sa
<b>Celastraceae</b>				
<i>Celastrus australis</i>	Staff Climber	V	Ln	Sa
<i>Celastrus subspicatus</i>	Large Staff Vine	V	Ln	Sa
<i>Loxocarpus barbatula</i> ( <i>Hippocratea</i> b.)	Knot Vine	V	Ln	Sa
<b>Canoniaceae</b>				
<i>Calochortus paniculatus</i>	Rose-leaf Marara	T	Ln	Wb
<i>Ceratopetalum apetalum</i> (-)	Cochwood	T	Ln	Wb
<i>Geissois benthamii</i>	Red Carabean	T	Ln	Wb
<i>Pseudocinnamomum</i>	Marara	T	Ln	Wb
<i>Ischnocarpa</i>	White Birch	T	Ln	Us/Wb
<i>Schizomeria ovata</i>				
<b>Ebenaceae</b>				
<i>Diopisyr fasciculata</i>	Grey Ebony	T	Ln	Wb
<i>Diopisyr pentameria</i>	Myrtle Ebony	T	Ln	Wb
<b>Ehretiaceae</b>				
<i>Cordia dichotoma</i> (-)	Cordia	T	Ln	Wb
<i>Ehretia acuminata</i>	Koda	T	Ln	Ad De
<b>Elaeocarpaceae</b>				
<i>Elaeocarpus eumundi</i>	Eumundi Quandong	T	Ln	Wb
<i>Elaeocarpus grandis</i>	Blue Quandong	T	Ln	Wb
<i>Elaeocarpus kirkii</i>	White Quandong	T	Ln	Wb
<i>Elaeocarpus obovatus</i>	Hard Quandong	T	Ln	Wb
<i>Sloanea australis</i>	Maiden's Blush	T	Ln	Wb
<i>Sloanea woolfii</i>	Yellow Carabean	T	Ln	Wb
<b>Escalloniaceae</b>				
<i>Quintinia verdonii</i>	Grey Possumwood	T	Ln	Wb
<b>Euphorbiaceae</b>				
<i>Antrodiaea swainii</i> (-)	Pink Cherry	T	Ln	Wb
<i>Baloghia inophylla</i> (B. lucida)	Scrub Bloodwood	T	Ln	Wb
<i>Bridelia exaltata</i>	Scrub Ironbark	T	Ln	Wb
<i>Bridelia leichardtii</i>	Leichardt's Ironbark	T	Ln	Wb
<i>Claoxylon australe</i>	Brittlewood	T	Ln	Wb
Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Dissiliaria baloghoides</i>	Lancewood	T	Ln	Wb
<i>Drypetes australasica</i>	Yellow Tulip	T	Ln	Wb
<i>Excoecaria agallocha</i>	Milky Mangrove	T	Ln St	Ad Coastal
<i>Excoecaria dallachiana</i>	Scrub Poison Tree	T	Ln	Wb
<i>Glochidion ferdinandi</i>	Cheese Tree	T	Ln	Wb
<i>Glochidion sumatranum</i>	Buttwood	T	Ln	Wb
<i>Mallotus discolor</i>	Yellow Kamala	T	Ln	Wb
<i>Mallotus philippensis</i>	Red Kamala	T	Ln	Wb
<b>Fabaceae</b>				
<i>Austroripariania blackii</i>	Blood Vine	V	Ln	Sa Oa
<i>Castanoxylum australe</i>	Black Bean	T	Ln	Wb
<i>Derris involuta</i>	Native Derris	V	Ln	Sa
<i>Erythrina sp. Lacey's Creek</i>	Corkwood	T	Ln	Ad De
<i>Erythrina vespertilio</i>	Batswing Coral Tree	T	Ln	Ad De
<i>Mucuna gigantea</i>	Burny Bean	V	Ln	Sa
<b>Flacourtiaceae</b>				
<i>Scolopia braunii</i>	Flintwood	T	Ln	Wb
<b>Flindersiaceae</b>				
<i>Flindersia australis</i>	Crows Ash	T	Ln	Wb
<i>Flindersia bennettiana</i>	Bennett's Ash	T	Ln	Wb
<i>Flindersia collina</i>	Leopard Ash	T	Ln	Wb
<i>Flindersia schottiana</i>	Cudgerie or Bumpy Ash	T	Ln	Wb
<i>Flindersia xanthoxyla</i>	Yellowwood	T	Ln	Wb
<b>Icacinaeae</b>				
<i>Citronella moorei</i>	Churnwood	T	Ln	Wb
<i>Pennantia cunninghamii</i>	Brown Beech	T	Ln	Wb
<b>Lauraceae</b>				
<i>Cryptocarya erythroxylon</i>	Pigeonberry Ash	T	Ln	Wb
<i>Cryptocarya hypoxantha</i>	Rib-fruit Pepperberry	T	Ln	Wb
<i>Cryptocarya macdonaldii</i>	Cooloola Laurel	T	Ln	Wb
<i>Cryptocarya micromera</i>	Murugun	T	Ln	Wb
<i>Cryptocarya obovata</i>	Pepperberry Tree	T	Ln	Wb
<i>Endandra muelleri</i>	Maeller's Walnut	T	Ln	Wb
<i>Endandra pubens</i>	Hairy Walnut	T	Ln	Wb
<i>Endandra sieberi</i> (-)	Hard Corkwood	T	Ln	Wb
<i>Neolitsea australiensis</i>	Grey Bolly Gum	T	Ln	Wb
<i>Neolitsea dealbata</i>	White Bolly Gum	T	Ln	Us/Wb
<b>Malvaceae</b>				
<i>Hibiscus tiliaceus</i>	Cotton Tree	T	Ln	Wb
<i>Lagunaria patersonii</i> (-)	Norfolk Is Hibiscus	T	Ln	Wb
<b>Meliaceae</b>				
<i>Anthocarpus nitidula</i> ( <i>Pseudocarya nitidula</i> )	Incense Cedar	T	Ln	Wb
<i>Dysoxylum fraserianum</i>	Rosewood	T	Ln	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
<i>Owenia ceptiodora</i>	Onion Cedar	T	Lm	Wb
<i>Toona australis</i>	Red Cedar	T	Lm	Wb/Ad
<b>Menispermaceae</b>				
<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
<b>Myrsinaceae</b>				
<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
<b>Monimiaceae</b>				
<i>Palmeria scandens</i>	Anchor Vine	V	Lm	Sa
<b>Moraceae</b>				
<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>sublanceolata</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>Malatista scandens</i>	Burny Vine	V	Lm	Sa
<b>Myrtaceae</b>				
<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>	Serb 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
<b>Nyctaginaceae</b>				
<i>Pisonia aculeata</i>	Native Bougainvillea	V	Lm	Sa

Scientific Name	Common Name	Form	Fire Retardance	Comments
<b>Oleaceae</b>				
<i>Olea paniculata</i>	Native Olive	T	Lm	Wb
<b>Piperaceae</b>				
<i>Piper novae-hollandiae</i>	Native Pepper Vine	V	Lm	Sa
<b>Pittosporaceae</b>				
<i>Pittosporum rhombifolium</i>	Hollywood	T	Lm	Wb
<b>Proteaceae</b>				
<i>Floydia praedaltia</i>	Ball Nut	T	Lm	Wb
<i>Grevillea hilliana</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
<b>Ranunculaceae</b>				
<i>Clematis aristata</i>	Old Man's Beard	V	Lm	Sa
<b>Rhamnaceae</b>				
<i>Alphitonia excelsa</i>	Red Ash	T	Lm	Wb
<i>Alphitonia petrei</i>	Pink Ash	T	Lm	Wb
<i>Emmenosperma alphonoides</i>	Yellow Ash	T	Lm	Wb
<b>Rosaceae</b>				
<i>Rubus moluccanus</i>	Molucca Bramble	V	Lm	Sa
<b>Rutaceae</b>				
<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
<b>Sapindaceae</b>				
<i>Alectryon reticulatus</i>	Alectryon	T	Lm	Wb
<i>Arytera lauterana</i>	Corduroy Tamarind	T	Lm	Wb
<i>Atalaya multiflora</i>	Broad-leaf White-wood	T	Lm	Wb
<i>Atalaya salicifolia</i> (A. virens)	Scrub White-wood	T	Lm	Wb
<i>Castanopsis 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 hillei</i>	Blunt-leaf Tulip	T	Lm	Wb
<i>Harpullia pendula</i>	Tulipwood	T	Lm	Wb



Scientific Name	Common Name	Form	Fire Retardance	Comments
<i>Jageria 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>Rhysoetochia bifoliolata</i> (-)	Twin-leaf Tuckeroo	T	Im	Wb
<i>Sarcopteryx stipata</i>	Corduroy	T	Im	Wb
<i>Toechima dasyrrhache</i>	Blunt-leaf Steelwood	T	Im	Wb
<b>Sapotaceae</b>				
<i>Amorphaespermum anilloquum</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 pohmaniana</i>	Yellow Boxwood	T	Im	Wb
<b>Simaroubaceae</b>				
<i>Ailanthus triphysa</i>	White Siris	T	Im	Wb
<i>Guilfoylia monostylis</i>	Native Plum	T	Im	Wb
<b>Siphonodontaceae</b>				
<i>Siphonodon australis</i>	Ivorywood	T	Im	Wb
<b>Sterculiaceae</b>				
<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 Bottletree	T	Im	Ad De
<i>Brachychiton sp.</i> (-)	Ormeau Bottletree	T	Im	Ad De
<i>Commersonia bartramia</i>	Brown Kurrajong	T	Im	Us/Wb
<i>Sterculia quadrifida</i>	Peanut Tree	T	Im	Ad De
<b>Symplocaceae</b>				
<i>Symplocos stawelli</i>	White Hazelwood	T	Im	Wb
<b>Ulmaceae</b>				
<i>Aphananthe philippinensis</i>	Native Elm	T	Im	Wb
<i>Celtis paniculata</i>	Investigator Tree	T	Im	Wb
<b>Urticaceae</b>				
<i>Dendrocnide excelsa</i>	Giant Stinging Tree	T	Im	Wb
<i>Dendrocnide photinophylla</i>	Mulberry Stinger	T	Im	Wb
<b>Verbenaceae</b>				
<i>Gmelina leichhardtii</i>	White Beech	T	Im	Wb
<i>Premna lignum-vitae</i>	Lignum-vitae	T	Im	Wb
<b>Vitaceae</b>				
<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>Tetragastium nitens</i>	Shining Grape	V	Im	Wb



Mangroves - nurseries for our fisheries (JB)



## **Appendix 2**

### **Site Plan**

[illegible]





## **Appendix 3**

### **Less combustible native plants list**

**Source: Bowden, J (1999)**



## **Appendix 4**

### **Residents Emergency Management Plan Guidelines**

# 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.

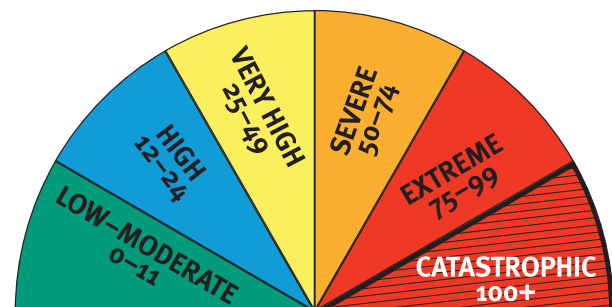
It is your responsibility  
to prepare yourself, your  
family and your  
home for the threat  
of bushfire.

## 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](http://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](http://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](http://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:

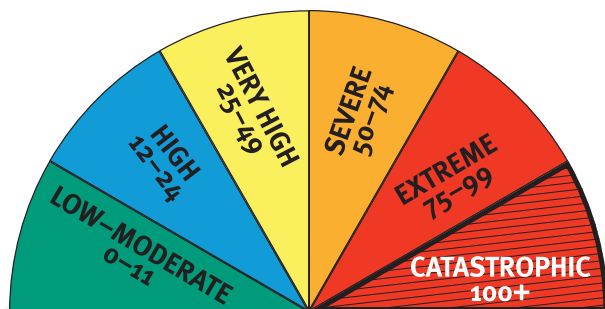
- NSPs do not cater for pets.
- Firefighters may not be present as they will be fighting the main fire front elsewhere.
- NSPs do not provide meals or amenities.
- They may not provide shelter from the elements, particularly flying embers.

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: (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 <input type="checkbox"/>	No <input type="checkbox"/>
Unrestricted gate access	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Clear of overhead power lines	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Able to reverse in	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Turning/passing areas	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Heavy vehicle access on cattle grid/bridge	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Alternative way out	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Two wheel drive access	Yes <input type="checkbox"/>	No <input type="checkbox"/>

## STRUCTURE/S

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

## WATER SUPPLY

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

## 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.

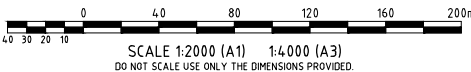
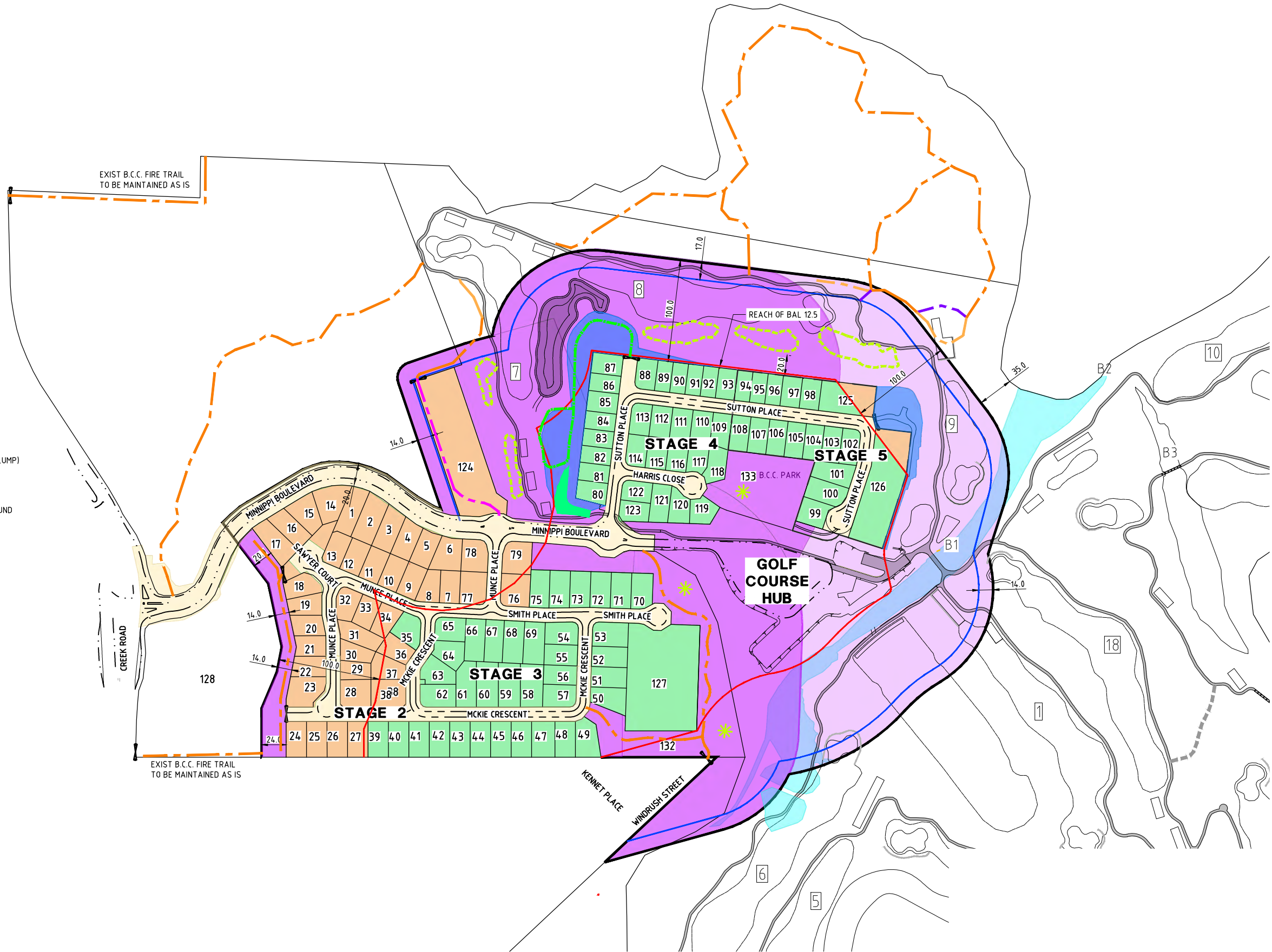
## **Appendix 2**

### **Updated Site Plans**



LEGEND

- DEVELOPED FIRE TRAIL NETWORK - SURVEYED
- DEVELOPED FIRE TRAIL - TO BE REALIGNED
- FIRE TRAILS - DEVELOPED WITH GOLF COURSE WORKS
- FIRE TRAIL WITHIN PRIVATE PROPERTY AND COVERED BY EASEMENT
- MAINTENANCE ACCESS TRACK TO BIO-BASINS
- ASSET PROTECTION ZONE BOUNDARY
- BAL 12.5
- BAL 19
- GATE
- ESTABLISHED FIRE RETARDANT UNDER-STOREY AND MID-STOREY PLANTING.
- ESTABLISHED HABITAT ZONES INCLUDES UNDER-STOREY AND MID-STOREY PLANTING. NOT LOCATED WITHIN 20 METRES OF RESIDENTIAL LOTS OR 20 METRES OF OUTER EDGE OF APZ.
- GOLF CART TRACK LOCATION (TO BE BUILT AS A PART OF THE GOLF COURSE)
- BAL LOW LOTS
- BAL 12.5 LOTS
- ESTABLISHED ASSET PROTECTION ZONE STAGE 2, 3 & 4
- ASSET PROTECTION ZONE STAGE 5/GOLF COURSE HUB
- ESTABLISHED ASSET PROTECTION ZONE (EXISTING MELALEUCA CLUMP)
- ESTABLISHED ASSET PROTECTION ZONE (1 IN 3 BATTERS FIRE RETARDANT GROUND COVERS AND TREES)
- ASSET PROTECTION ZONE (1 IN 3 BATTERS FIRE RETARDANT GROUND COVERS AND TREES) (TO BE DEVELOPED WITH GOLF COURSE)
- WINDRUSH CHANNEL MARINE PLANTS




User: ETHAN SCHAFER-SRW Name: C:\Synergy\data\1025\synergy\B00143\_SK605\1 SKETCHES\B00143-SK605  
Plot Date: 13/08/2019 4:36:51 PM

B		WINDRUSH CHANNEL MARINE PLANTS ADDED		ESS	ESS	13/08/19
A		ISSUED FOR OPERATIONAL WORKS APPROVAL		ESS	LD	MKB
No.		Amendments	Drawn	Design	Appd	Registered Engineer Reg No. Date
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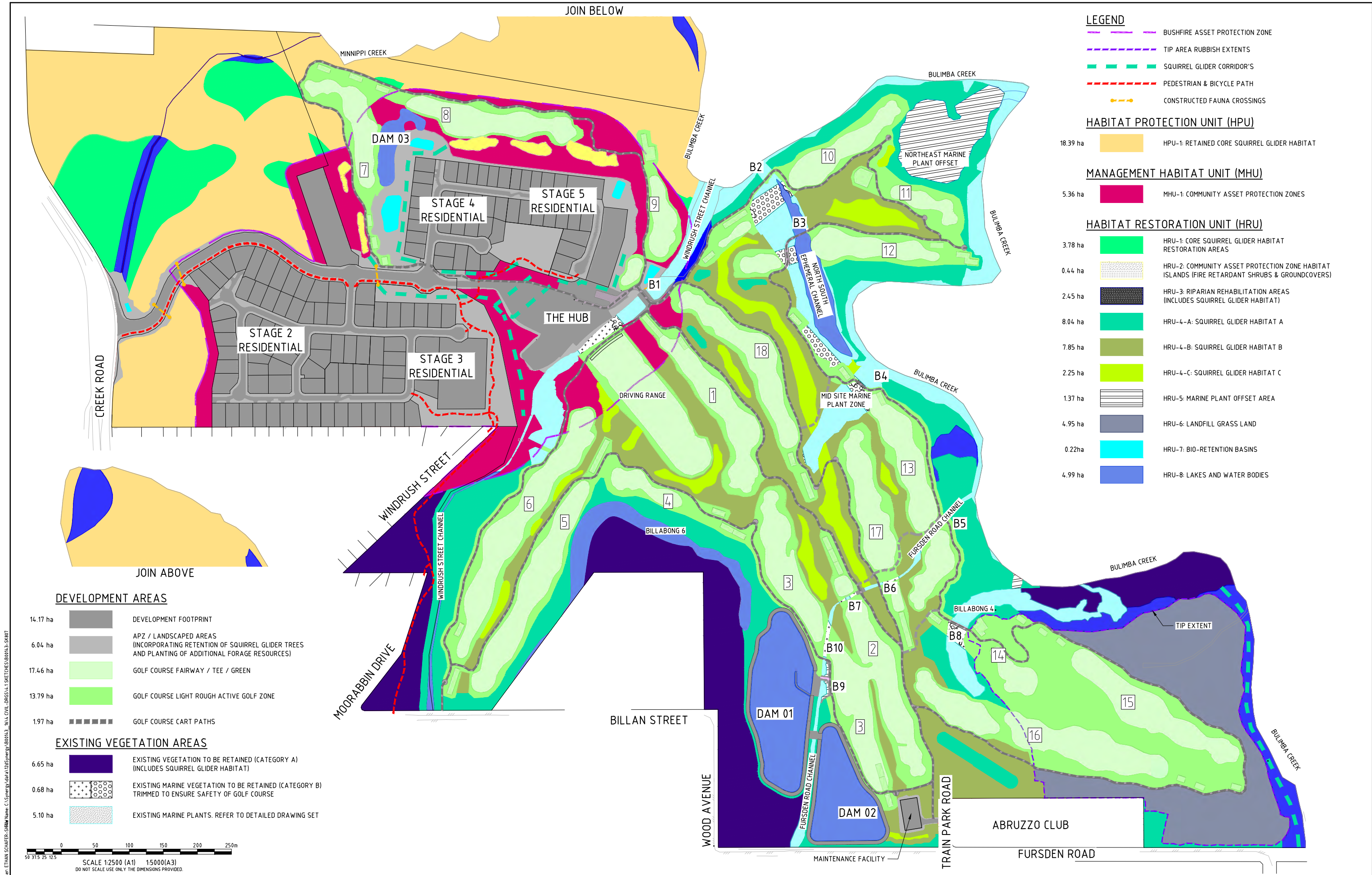
ENGINEERS & PROJECT MANAGERS

ABN 23 010 743 692

Client	BMD PROPERTIES PTY LTD		Datum	AHD	
Project	CANNON HILL COMMUNITY LINKS GOLF COURSE		PSM	119825	
Title	FIRE MANAGEMENT LAYOUT PLAN GOLF COURSE AND STAGE 5		RL	2.60M	NOT FOR CONSTRUCTION
			(MGA) COORD		
			Project No.	Drawing No.	Rev
			B00143-SK605		B







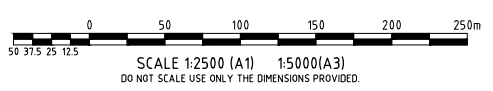
- LEGEND**
- BUSHFIRE ASSET PROTECTION ZONE
  - TIP AREA RUBBISH EXTENTS
  - SQUIRREL GLIDER CORRIDOR'S
  - PEDESTRIAN & BICYCLE PATH
  - CONSTRUCTED FAUNA CROSSINGS
- HABITAT PROTECTION UNIT (HPU)**
- 18.39 ha HPU-1: RETAINED CORE SQUIRREL GLIDER HABITAT
- MANAGEMENT HABITAT UNIT (MHU)**
- 5.36 ha MHU-1: COMMUNITY ASSET PROTECTION ZONES
- HABITAT RESTORATION UNIT (HRU)**
- 3.78 ha HRU-1: CORE SQUIRREL GLIDER HABITAT RESTORATION AREAS
  - 0.44 ha HRU-2: COMMUNITY ASSET PROTECTION ZONE HABITAT ISLANDS (FIRE RETARDANT SHRUBS & GROUNDCOVERS)
  - 2.45 ha HRU-3: RIPARIAN REHABILITATION AREAS (INCLUDES SQUIRREL GLIDER HABITAT)
  - 8.04 ha HRU-4-A: SQUIRREL GLIDER HABITAT A
  - 7.85 ha HRU-4-B: SQUIRREL GLIDER HABITAT B
  - 2.25 ha HRU-4-C: SQUIRREL GLIDER HABITAT C
  - 1.37 ha HRU-5: MARINE PLANT OFFSET AREA
  - 4.95 ha HRU-6: LANDFILL GRASS LAND
  - 0.22ha HRU-7: BIO-RETENTION BASINS
  - 4.99 ha HRU-8: LAKES AND WATER BODIES

**DEVELOPMENT AREAS**

- 14.17 ha DEVELOPMENT FOOTPRINT
- 6.04 ha APZ / LANDSCAPED AREAS (INCORPORATING RETENTION OF SQUIRREL GLIDER TREES AND PLANTING OF ADDITIONAL FORAGE RESOURCES)
- 17.46 ha GOLF COURSE FAIRWAY / TEE / GREEN
- 13.79 ha GOLF COURSE LIGHT ROUGH ACTIVE GOLF ZONE
- 1.97 ha GOLF COURSE CART PATHS

**EXISTING VEGETATION AREAS**

- 6.65 ha EXISTING VEGETATION TO BE RETAINED (CATEGORY A) (INCLUDES SQUIRREL GLIDER HABITAT)
- 0.68 ha EXISTING MARINE VEGETATION TO BE RETAINED (CATEGORY B) TRIMMED TO ENSURE SAFETY OF GOLF COURSE
- 5.10 ha EXISTING MARINE PLANTS. REFER TO DETAILED DRAWING SET



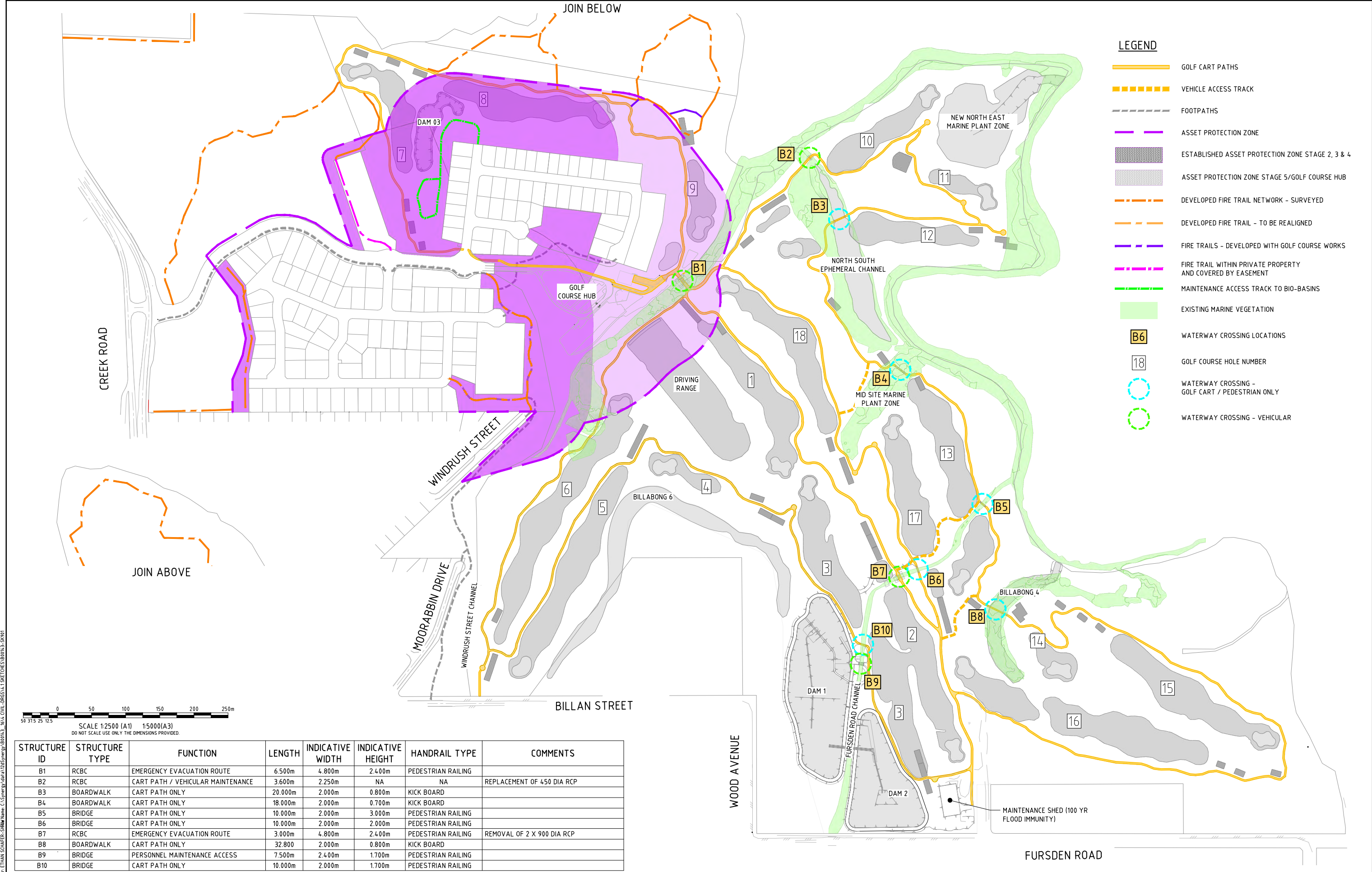
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C	ISSUED FOR OPERATIONAL WORKS APPROVAL	ESS	LD	MKB		07/08/19
B	DAM 01 LAYOUT AMENDED	ESS	LD	MKB		12/02/19
A	ORIGINAL ISSUE	ESS	LD	MKB		30/11/18
No.	Amendments	Drawn	Design	Appd	Registered Engineer	Reg No. Date

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ABN 23 010 743 692

Client	BMD PROPERTIES PTY LTD			Datum	AHD
Project	CANNON HILL COMMUNITY LINKS GOLF COURSE			PSM	119825
Title	OVERALL HABITAT MANAGEMENT PLAN			RL	2.60
				(MGA) COORD	
				NOT FOR CONSTRUCTION	
	Project No.	Drawing No.	Rev		
	B00143-SK807		D		





- LEGEND
- GOLF CART PATHS

VEHICLE ACCESS TRACK

FOOTPATHS

ASSET PROTECTION ZONE

ESTABLISHED ASSET PROTECTION ZONE STAGE 2, 3 & 4

ASSET PROTECTION ZONE STAGE 5/GOLF COURSE HUB

DEVELOPED FIRE TRAIL NETWORK - SURVEYED

DEVELOPED FIRE TRAIL - TO BE REALIGNED

FIRE TRAILS - DEVELOPED WITH GOLF COURSE WORKS

FIRE TRAIL WITHIN PRIVATE PROPERTY AND COVERED BY EASEMENT

MAINTENANCE ACCESS TRACK TO BIO-BASINS

EXISTING MARINE VEGETATION

B6

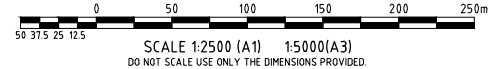
WATERWAY CROSSING LOCATIONS

18

GOLF COURSE HOLE NUMBER

WATERWAY CROSSING - GOLF CART / PEDESTRIAN ONLY


WATERWAY CROSSING - VEHICULAR



STRUCTURE ID	STRUCTURE TYPE	FUNCTION	LENGTH	INDICATIVE WIDTH	INDICATIVE HEIGHT	HANDRAIL TYPE	COMMENTS
B1	RCBC	EMERGENCY EVACUATION ROUTE	6.500m	4.800m	2.400m	PEDESTRIAN RAILING	
B2	RCBC	CART PATH / VEHICULAR MAINTENANCE	3.600m	2.250m	NA	NA	REPLACEMENT OF 450 DIA RCP
B3	BOARDWALK	CART PATH ONLY	20.000m	2.000m	0.800m	KICK BOARD	
B4	BOARDWALK	CART PATH ONLY	18.000m	2.000m	0.700m	KICK BOARD	
B5	BRIDGE	CART PATH ONLY	10.000m	2.000m	3.000m	PEDESTRIAN RAILING	
B6	BRIDGE	CART PATH ONLY	10.000m	2.000m	2.000m	PEDESTRIAN RAILING	
B7	RCBC	EMERGENCY EVACUATION ROUTE	3.000m	4.800m	2.400m	PEDESTRIAN RAILING	REMOVAL OF 2 X 900 DIA RCP
B8	BOARDWALK	CART PATH ONLY	32.800	2.000m	0.800m	KICK BOARD	
B9	BRIDGE	PERSONNEL MAINTENANCE ACCESS	7.500m	2.400m	1.700m	PEDESTRIAN RAILING	
B10	BRIDGE	CART PATH ONLY	10.000m	2.000m	1.700m	PEDESTRIAN RAILING	

D	FIRETRAILS ADDED AND LAYOUT AMENDED	ESS	ESS			13/08/19
C	ISSUED FOR BCC DISCUSSIONS	ESS	LD			15/07/19
B	DAM 01 LAYOUT AMENDED	ESS	LD	MKB		12/02/19
A	ORIGINAL ISSUE	ESS	LD	MKB		30/11/18
No.	Amendments	Drawn	Design	Appd	Registered Engineer	Reg No. Date
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Client	BMD PROPERTIES PTY LTD		Datum AHD	
Project	CANNON HILL COMMUNITY LINKS GOLF COURSE		PSM 119825 RL 2.60 (MGA) COORD	
Title	MOBILITY NETWORK AND WATER WAY CROSSING LOCATIONS		NOT FOR CONSTRUCTION	
	Project No.	Drawing No.	Rev	
	B00143-SK901		D	