Bushland Protection Systems
Specialising in
BUSHFIRE HAZARD
PLANNING & MITIGATION

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BUSHFIRE HAZARD ASSESSMENT AND MITIGATION PLAN

FOR THE APPROVED DEVELOPMENT

ON
Lot 95 CA311434 and Lot 96 SP225226
No. 174 Redbank Creek Road,
Adare
(Previously No. 63)

FOR

Parklands @ Adare P/L

DATED

26th April 2024

A Bushfire Mitigation Plan is designed to identify and minimise the potential bushfire risk to a given property and to help property owner/occupiers to minimise bushfire risk to themselves, their property and their neighbours, although it cannot completely eliminate that risk. Ultimately it is a community responsibility to protect the environmental values, life and property in their area.

Bushland Protection Systems
Document Control:

Version	Date	Details	Prepared	Checked
1	02/02/2010	Initial BMP	Clyde Bain	
2	11/11/2013	Updated BMP – Updated lot numbers	Brett Bain	
3	20/04/2022	Updated BMP – Current legislation	Brett Bain	
4	09/06/2022	Updated BMP – Amended Layout	Brett Bain	
5	14/06/2022	Amended BMP – Lots 35-37	Brett Bain	
6	24/07/2023	Amended BMP – Lot and road width changes	Brett Bain	
7	26/04/24	Amended – Stage 5	Brett Bain	

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1. Background

This plan is an update for the approved development over Lots 95 CA311434 & 96 SP225226, No. 174 Redbank Creek Road, Adare, as shown in Appendix 1. The approved development is currently subject to the approved 'Updated Bushfire Hazard Assessment and Mitigation Plan' (BMP), produced by Bushland Protection Systems, dated 24/6/2022. This report is provided as an update due to reconfiguration of the lot and road layout in Stages 4, 5, 6 & 7. This report is consistent with the intent of the previous approved 2013 & 2022 BMPs.

This plan is based on the following materials from the approved DA and previous BMPs.

1.1. A copy of the Park Lake Adare Sales Plan, showing lot layout, and bushfire mitigation infrastructure, produced by BPlanned and Surveyed, drawing no. 001762_SALES_REV C, Revision C, Sheet 1 of 1, dated 28/3/2024, is included as Appendix 1

This plan and its mitigation measures are consistent with the approval under the State Planning Policy 1/03, *Mitigating the Adverse Impacts of Flood, Bushfire and Landslide*, under the Queensland Sustainable Planning Act 2009 and the Gatton Shire Planning Scheme – Part 5, Division 3 – Potential Bushfire Risk Code. The plan also provides re-assessment of ratings in accordance with the State Planning Policy 7/17, under the Planning Act 2016 and AS3959-2018.

2. Site Description and Bushfire Hazard Assessment

The property has been heavily grazed by cattle, consisting of pasture grasses with scattered mature eucalypts and re-growth eucalypts. There were also some areas of lantana growth. The topography is generally level with slopes ranging up to 5%. There is no evidence of past fire history on the property.

For the development site itself, as a grazing property, it would be assigned a Vegetation Hazard Class of 39.2, resulting in a 'Not Bushfire Prone Area' hazard rating, however this will change post development. The managed areas of the future allotments would be assigned a VHC 41.4, resulting in a 'Not Bushfire Prone Area' hazard rating.

Some of the future allotments have covenants within them which adjoin either the open space areas within the development or adjoining bushland on neighbouring sites, supplementing the bushland in these locations. These covenant areas would be assigned a VHC 10.1 with associated fuel loads of up to 20.8t/Ha, over slopes of up to 2 degrees and a Forest Fire Danger Index (FFDI) of 63, providing for a potential fire line intensity of up to 18,001kW/m equating to a 'Medium' hazard rating.

As shown in Appendix 1, parkland has been proposed to create core conservation and buffer conservation areas. These park areas will provide a bushland exposure to neighbouring new lots. Conservation areas would be assigned a VHC 10.1 with associated fuel loads of up to 20.8t/Ha, over slopes of up to 2 degrees and a Forest Fire Danger Index (FFDI) of 63, providing for a potential fire line intensity of up to 18,001kW/m equating to a 'Medium' hazard rating.

Existing Lot 101 to the north of the proposed development, consists of grassy eucalypt woodland which would be assigned a VHC 10.1 with associated fuel loads of up to 20.8t/Ha, over slopes of up to 2 degrees and an FFDI of 63, providing for a potential fire line intensity of up to 18,001kW/m equating to a 'Medium' hazard rating.

Properties to the east and northeast that are being used as part of a nursery or for orchards, are a managed area and are assigned a VHC 38.5, resulting in a 'Not Bushfire Prone Area' hazard rating.

The properties adjoining the southeast corner of the proposed development, consist of eucalypt forest, which would be assigned a VHC 10.1 with associated fuel loads of up to 20.8t/Ha, over slopes of up to 2 degrees and an FFDI of 63, providing for a potential fire line intensity of up to 18,001kW/m equating to a 'Medium' hazard rating.

To the south of the site is road frontage to Redbank Creek Road. On the opposite side of the roadway are established well maintained rural residential allotments, except for a small managed portion of Council parkland. These properties and parkland are assigned a VHC 41.4, resulting in a 'Not Bushfire Prone Area' hazard rating.

To the west is road frontage with Adare Road. On the opposite side of Adare Road are a number of rural properties. There is a grazing property to the northwest (existing Lot 206) which consists of open grazed grassland which would be assigned a VHC 41.4, resulting in a 'Not Bushfire Prone Area' hazard rating. This allotment would not pose a significant bushfire risk in its current condition. Existing Lots 53 & 1 to the west of the proposed development consist of eucalypt forest and would be assigned a VHC 10.1 with associated fuel loads of up to 20.8t/Ha, over slopes of up to 2 degrees and an FFDI of 63, providing for a potential fire line intensity of up to 18,001kW/m equating to a 'Medium' hazard rating. These lots are a bushfire hazard however road separation is already in place with the presence of Adare Road. In addition, there is a house and managed area in the southeast corner of Lot 1 SP118690 which provides additional separation for Lots 78 & 79 of the development.

All future dwellings will have a minimum 20 metre separation from hazardous bushland in accordance with the intent of the approved 2013 BMP and as shown in Appendix 1.

Table 2.1: Potential Bushfire Hazard Rating

POTENTIAL HAZARD CLASS	POTENTIAL FIRELINE INTENSITY
Not Bushfire Prone Area (Low)	<4,000 kw/m
Medium	4,000 to 20,000 kw/m
High	20,000 to 40,000 kw/m
Very High	>40,000 kw/m

The Bushfire Hazard Mapping also incorporates a 100 metre Potential Impact Buffer meaning that any land within 100 metres of a Potential Bushfire Hazard is also assigned the same rating as that bushland and triggers the Bushfire Code if Medium, High or Very High. Whilst having the same distance for all three levels of hazard is not considered a fit for purpose application, it is unfortunately what is legislated at this current time. Therefore, the future Lots 1-36, 38-43, 46-57, 62-65, 68-96, 106-109, 116-119, 128-143, 146 & 147 will be assigned a 'Medium' hazard rating, while Lots 44, 45, 58-61, 66, 67, 97-105, 110-115, 120-127, 144 & 145 are assigned a Low/No hazard rating.

3. Roads, Driveways and Trails

3.1. Roads

The proposed road network allows for two entry/exit points, one to Redbank Creek Road and one to Adare Road. With the many maintained properties along Redbank Creek Road, it is considered unlikely the access/egress would be denied during a local bushfire event. Part of Adare Road consists of bushland and could be restricted for brief periods of time, however the likelihood of access/egress being denied is limited.

3.2. Driveways

With the allotments being small acreage, dwellings will have relatively short direct driveways located in managed areas, unlikely to be compromised by bushfire.

3.3. Trails

A fire trail is proposed along the rear of lots 129, 130, 132, 133 and 135-142. This trail is to be outside the lots with connection to Redbank Creek Road and to the proposed roadway at lot 142. A connection trail is to be located between lots 136 & 137 for access back to the proposed roadway.

A fire trail is proposed along the rear boundaries of lots 18-27. This trail is to be outside the lots with connection to the proposed roadway at lot 18 and lot 27. A connection trail is to be located between lots 24 & 25 for access back to the proposed roadway.

A fire trail is proposed along the rear of lots 78 and 80-81. This trail is to be outside the lots with connection to the Redbank Creek Road and Adare Road.

A fire trail is proposed along the northern boundaries lots 38 & 39. This trail is to be outside the lots with connection to the Adare Road and the proposed roadway at lot 39.

A fire trail is proposed along the southern boundaries of lots 1-14 and 17. This trail is to be outside the lots with connection to the proposed roadway at lot 17 and to Adare Road. A connection trail is to be located between lots 4 & 5 for access back to the proposed roadway.

A fire trail/Emergency Egress is to be provided from the cul-de-sac at Lot 1, through Lot 1, to Adare Road as shown in Appendix 1. This trail is only to be used under the direction of Emergency Services.

The fire trails are to be 6 metres in width with 4 metres formed. All fire trails would be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion, Appendix 5 on fire trails is included in this report as a guide on establishing and maintaining fire access trails. Maintenance of fire trails outside allotments will be the responsibility of Council, once off maintenance.

The fire trail network assists in providing separation for lots without road separation and also provides access to parkland areas for vegetation management and fire suppression and mitigation activities. Fire trails are to be provided with gated access with Council Locks and keys provided to the local Fire Brigade.

4. Appropriate Building Location

Where the new allotments adjoin bushland (i.e. northern and eastern boundaries and retained internal parkland), building envelopes are to be established on each lot that will provide for appropriate setbacks from boundaries to allow the implementation of Asset Protection Zones (radiation zones) of a 20 metre minimum between housing and the bushland areas. These Asset Protection Zone (APZ) requirements are outlined in Section 5 of this report. Fire trails and roadways can be included when measuring APZs, e.g. 6 metre wide fire trail plus 14 metre setback equals 20 metres separation.

Dwellings on conservation lots are to have a minimum separation of 20 metres from the conservation bushland areas.

Where roadway separation exists between the allotment and bushland, and the road reserve width is less than 20 metres, the dwelling must have a setback from the roadway boundary that ensures a minimum 20 metre separation from bushland for the dwelling. I.e. if the road reserve is 16 metres in width, the dwelling must be setback a minimum of 4 metres from the roadside lot boundary.

Dwellings should be located as close to roadways as practical, to provide short direct access, but allowing for minimum separations as outlined in the paragraph above.

5. Appropriate Clearing and Landscaping

As a minimum all dwellings should be provided with a 10 metre inner APZ around the building, as outlined in Appendix 2 of this report, with a further 10 metre outer APZ where ground fuel is managed and mid storey fuel is thinned. Any remaining land in the allotments, outside the covenant areas, is to also be managed as an outer APZ. APZs overlap with neighbouring radiation zones where housing is located close enough to provide each other protection. Fire trails and roadways can form part of an APZ. Basins 5 & 7, located within allotments are still to be managed as APZs.

Quality trees and habitat trees can be retained or planted within these buffer zones provided they do not provide a continuous canopy cover or pose a threat to persons or property.

Driveways are to be managed with low ground fuel to minimise the potential for localised bushfire hindering access or egress. Low branches along driveways should be removed to a height of 2 metres to assist in preventing fire from climbing into treetops. Branches overhanging driveways should be removed to a minimum height of 4 metres to ensure access by medium and heavy fire vehicles. Appendix 4 on long driveways will assist owners with the maintenance of their driveways to prevent delays in attending to an emergency by fire services.

Owners of land with covenanted areas are to maintain the covenanted area by the removal of non-endemic grass and weed species within the covenanted area to reduce the risk of bushfire damage to their properties or the local ecosystems.

All previous or future cleared timber and foliage or accumulated rubbish should be removed from the site or mulched and not simply moved aside as this will result in a concentrated area of fuel loading which will increase the potential bushfire hazard from that direction.

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of rainforest species. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore, by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced and the risk of spot fires minimised. Wastewater may possibly be utilised to achieve this outcome.

Open space parkland areas should be managed by the removal of non-endemic grass and weed species within the parkland to reduce the risk of bushfire damage to properties or the local ecosystems.

If the development is to take place in stages, care should be exercised to ensure the developed stages are not threatened by bushfire from the undeveloped stages, by providing a minimum 20 metre managed vegetation buffer.

6. Building Construction

The bushfire provisions of the National Construction Code (NCC) are applied to Class 1, 2 & 3 buildings and associated Class 10a buildings, located in designated bushfire prone areas. "Designated bushfire prone area means land which has been designated under a power in legislation as being subject, or likely to be subject, to bushfires" *(NCC Schedule 3 Definitions)*.

The Gatton Shire Planning Scheme V.2, June 2007, Part 5, Division 4, Section 5.14 provides the following definition: "*A Potential Bushfire Risk Area is defined as High and Medium Risk Areas defined on the applicable Overlay*."

For the new lots with a 'Medium' hazard rating, as identified in Section 2 of this report, the Gatton Shire Planning Scheme V.2, June 2007, Part 5, Division 4, Section 5.14 requires the bushfire components of the National Construction Code (NCC) and where relevant the Australian Standard for Construction of Buildings in Bushfire-Prone Areas (AS3959) to be addressed.

P2.7.5 of the NCC requires:- A Class 1 building or a Class 10a building or deck associated with a Class 1 building that is constructed in a designated bushfire prone area must, to the degree necessary, be designed and constructed to reduce the risk of ignition from a bushfire, appropriate to the –

(a) Potential for ignition caused by burning embers, radiant heat or flame generated by a bushfire; and
(b) Intensity of the bushfire attack on the building.

Section 3.10.5.0 (Qld variation) of the NCC is the deemed-to-satisfy provision and states:-

(a) Subject to (b), Performance Requirement P.2.7.5 is satisfied for—
(i) a Class 1 building; or
(ii) a Class 10a building or deck associated with a Class 1 building,
located in a designated bushfire prone area if it is constructed in accordance with—
(iii) AS 3959; or
(iv) NASH Standard – Steel Framed Construction in Bushfire Areas.

(b) The requirements of (a) do not apply when, in accordance with AS 3959, the classified vegetation is Group F rainforest (excluding wet sclerophyll forest types), mangrove communities and grasslands under 300 mm high.

Where a Performance Solution is proposed, the relevant Performance Requirements must be determined in accordance with Sections A2.2(3) and A2.4(3) of the NCC as applicable. Section V2.7.2 of the NCC is a means to verify the appropriate risk of ignition from a bushfire in order to meet the requirement of P2.7.5. For further guidance refer to the Buildings in Bushfire Prone Area Verification Method Handbook available from the Australian Building Code Board.

For the most accurate result, assessment Method 2 has been utilised in accordance with AS3959-2018. Input values include the slopes, fuel loads and distances outlined above. Method 2, determined the following ratings based on separation distance:

- If the distance between the unmanaged bushland and the building is between 16 - 23 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-19. A BAL-19 level requires sections 3 and 6 of AS3959-2018 to be applied.
- If the distance between the unmanaged bushland and the building is between 23 - 100 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-12.5. A BAL-12.5 level requires sections 3 and 5 of AS3959-2018 to be applied.
- If the distance between the unmanaged bushland and the building is greater than 100 metres, the Bushfire Attack Level for the proposed dwelling will equate to BAL-LOW. A BAL-LOW level requires no specific construction standards under AS3959-2018 in relation to bushfire.

Section 3.5 of AS3959-2009 states "*The construction requirements for the next lower BAL than that determined for the site may be applied to an elevation of the building where the elevation is not exposed to the source of bushfire attack*." Therefore, elevations of buildings facing away from the bushland, sheltered by the rest of the building, can be discounted one BAL level, (e.g. The rural residential lots 129-130 would have the west elevation discounted). The BAL for sheltered elevations cannot be discounted to less than BAL-12.5.

These levels of construction are reliant on the recommendations of this report being implemented and maintained.

6.1. Lot 1

The future dwelling on Lot 1 is required to have a minimum separation of 20 metres from the northern lot boundary and the covenant area within the lot.

- If the dwelling is within 23 metres of the northern boundary and/or 23 metres of the covenant boundaries, the dwelling would be assigned a BAL-19, requiring Sections 3 & 6 of AS3959-2018 to be applied.
- If the dwelling is 23 metres or more from the northern lot boundary and more than 23 metres from the covenant boundaries, the dwelling would be assigned a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

There may be a possibility of downgrading a shielded side, however without knowing the exact footprint of the future building on the lot, this is impossible to determine at this time. It would be advisable to contact the author of this report at the time the building footprint is known for advice.

6.2. Lots 2, 3 & 6-14

Future dwellings on Lots 2, 3 & 6-14 have a minimum 16 metre roadway and minimum 4 metre in lot setback providing 20 metres of separation from the northern bushland. The future dwellings are required to have a minimum separation of 20 metres from the covenant area within the lot.

- If the dwelling is more than 23 metres from the covenant areas and more than 7 metres from the northern lot boundary, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant areas and more than 7 metre from the northern lot boundary, then the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of the northern lot boundary and more than 23 metre from the covenant area, then the south elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant area and within 7 metres of the northern boundary, then the whole building is to be constructed to a BAL-19 rating, requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.3. Lot 4

The future dwelling on Lot 4 has a minimum 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the northern bushland. The future dwelling is required to have a minimum separation of 20 metres from the covenant area within the lot and from the eastern lot boundary.

- If the dwelling is within 7 metres of the northern boundary, or 23 metres of the eastern lot boundary, or 23 metres of the covenant boundary, the dwelling would be assigned a BAL-19, requiring Sections 3 & 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the northern lot boundary and 23 metres or more from the eastern lot boundary, and more than 23 metres from the covenant boundary, the dwelling would be assigned a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

There may be a possibility of downgrading a shielded side, however without knowing the exact footprint of the future building on the lot, this is impossible to determine at this time. It would be advisable to contact the author of this report at the time the building footprint is known for advice.

6.4. Lot 5

The future dwelling on Lot 5 has a minimum 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the northern bushland. The future dwelling is required to have a minimum separation of 20 metres from the covenant area within the lot and 14 metres from the western lot boundary.

- If the dwelling is within 7 metres of the northern boundary, or 17 metres of the western lot boundary, or 23 metres of the covenant boundary, the dwelling would be assigned a BAL-19, requiring Sections 3 & 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the northern lot boundary and 17 metres or more from the western lot boundary, and more than 23 metres from the covenant boundary, the dwelling would be assigned a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

There may be a possibility of downgrading a shielded side, however without knowing the exact footprint of the future building on the lot, this is impossible to determine at this time. It would be advisable to contact the author of this report at the time the building footprint is known for advice.

6.5. Lot 15

The future dwelling on Lot 15 has a minimum 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the northern bushland and is required to have a minimum 20 metre separation from the covenant areas within Lots 14 & 17.

- If the dwelling is more than 23 metres from the covenant areas and more than 7 metres from the northern lot boundary, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant areas and more than 7 metre from the northern lot boundary, then the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of the northern lot boundary and more than 23 metre from the covenant area, then the south elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant area and within 7 metres of the northern boundary, then the whole building is to be constructed to a BAL-19 rating, requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.6. Lot 16

The future dwelling on Lot 16 has a minimum 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the northern bushland, and well over 23 metres separation from covenant areas on neighbouring lots.

- If the dwelling is within 7 metres of the northern lot boundary, the south elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the northern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.7. Lot 17

The future dwelling on Lot 17 is required to have a minimum 20 metre separation from the covenant areas within the lot.

- If the dwelling is within 23 metres of the covenant area, the whole building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 23 metres or more from the covenant area, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.8. Lots 18-24

The future dwellings on Lots 18-24 have a 6 metre fire trail along the rear lot boundary and a minimum 14 metre building setback from the rear lot boundary, totalling 20 metres separation.

- If the dwelling is within 17 metres of the rear lot boundary, the front elevation of the dwelling (facing Burton Crescent) can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the rear lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.9. Lot 25

The future dwelling on Lot 25 has a 6 metre fire trail along the rear lot boundary and a minimum 14 metre building setback from the rear lot boundary, totalling 20 metres separation. There is also a minimum 20 metre separation required from the covenant area within the lot.

- If the dwelling is within 17 metres of the rear lot boundary or within 23 metres of the covenant area, then the front elevation of the dwelling (facing the road) can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the rear lot boundary and 23 metres or more from the covenant area, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.10. Lots 26 & 139-141

The future dwellings on Lots 26 & 139-141 are required to have a minimum 20 metre separation from the covenant area within the lot.

- If the dwelling is within 23 metres of the covenant area, the front elevation of the dwelling (facing the road) can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.

- If the dwelling is 23 metres or more from the covenant area, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.11. Lot 27

The future dwelling on Lot 27 is required to have a minimum separation of 20 metres from the covenant area within the lot and from the southern lot boundary.

- If the dwelling is more than 23 metres from the covenant area and southern lot boundary, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant area and more than 23 metre from the southern lot boundary, then the west (front) elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the southern lot boundary and more than 23 metre from the covenant area, then the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant area and southern lot boundary, then the whole building is to be constructed to a BAL-19 rating, requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.12. Lots 28, 34-36, 40-43, 51-55, 62, 63, 65, 68-72, 79, 82-96, 106-109, 116-119, 128, 131, 134 & 146

The future dwellings on Lots 28, 34-36, 40-43, 52-55, 62, 63, 65, 68-72, 79, 82-96, 106-109, 116-119, 128, 131, 134 & 146 are within 100 metres of hazardous bushland but will have over 23 metres of separation, therefore the dwellings are to be constructed to a BAL-12.5, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.13. Lots 29, 30, 46-50 & 74-76

The future dwellings on Lots 29, 30, 46-50 & 74-76 have a 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the bushland.

- If the dwelling is within 7 metres of the front lot boundary, the rear elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the front lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.14. Lot 31

The future dwelling on Lot 31 has a minimum 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the bushland to the west and south.

- If the dwelling is more than 7 metres from both the western and southern lot boundaries, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of the western lot boundary and more than 7 metre from the southern lot boundary, then the east elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of the southern lot boundary and more than 7 metre from the western lot boundary, then the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of both the southern and western lot boundaries, then the whole building is to be constructed to a BAL-19 rating, requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.15. Lot 32 & 147

The future dwellings on Lots 32 & 147 have a 16 metre roadway and 4 metre in-lot setback providing a total of 20 metres of separation from the bushland to the south.

- If the dwelling is within 7 metres of the southern lot boundary, the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the southern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.16. Lot 33

The future dwelling on Lot 33 has a 16 metre roadway and 4 metre in-lot setback providing a minimum of 20 metres of separation from the bushland.

- If the dwelling is within 7 metres of the roadside lot boundary, the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the roadside lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.17. Lots 38 & 39

The future dwellings on Lots 38 & 39 have a 6 metre fire trail along the north-northwest lot boundary and a minimum 14 metre building setback from the north-northwest lot boundary, totalling 20 metres separation from the adjoining bushland.

- If the dwelling is within 17 metres of the north-northwest lot boundary, the south/southeast elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.

- If the dwelling is 17 metres or more from the north-northwest lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.18. Lots 56, 57 & 64

The future dwellings on Lots 56, 57 & 64 have a minimum 20 metre building setback from the southern lot boundary providing 20 metres separation from the adjoining bushland.

- If the dwelling is within 23 metres of the southern lot boundary, the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 23 metres or more from the southern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.19. Lots 73

The future dwellings on Lots 73 have a 16 metre roadway and 4 metre in-lot separation from the bushland.

- If the dwelling is within 7 metres of the eastern lot boundary, the west elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 7 metres or more from the eastern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.20. Lot 77

The future dwelling on Lot 77 has a 16 metre roadway and 4 metre in-lot separation from the bushland.

- If the dwelling is more than 7 metres from the eastern lot boundary and southern lot boundary, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of the eastern lot boundary and more than 7 metres from the southern lot boundary, then the west elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 7 metres of the southern lot boundary and more than 7 metres from the eastern lot boundary, then the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.

- If the dwelling is within 7 metres of the eastern and southern lot boundary, then the whole building is to be constructed to a BAL-19 rating, requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.21. Lot 78, 80 & 81

The future dwellings on Lots 78, 80 & 81 have a 6 metre fire trail along the northern lot boundary and a minimum 14 metre building setback from the northern lot boundary, totalling 20 metres separation from the adjoining bushland.

- If the dwelling is within 17 metres of the northern lot boundary, the south elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the northern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.22. Lots 129, 130, 132

The future dwellings on Lots 129, 130 & 132 have a 6 metre fire trail along the eastern lot boundary and a minimum 14 metre building setback from the eastern lot boundary, totalling 20 metres separation from the adjoining bushland.

- If the dwelling is within 17 metres of the eastern lot boundary, the west elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the eastern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.23. Lot 133

The future dwelling on Lot 133 has a 6 metre fire trail at the southeast corner of the lot and a minimum 14 metre building setback from the southeast corner, totalling 20 metres separation from the adjoining bushland.

- If the dwelling is within 17 metres of the southeast corner of the lot, the north and west elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the southeast corner of the lot, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.24. Lots 135-137

The future dwellings on Lots 135-137 have a 6 metre fire trail along the southern lot boundary and a minimum 14 metre building setback from the southern lot boundary, totalling 20 metres separation from the adjoining bushland.

- If the dwelling is within 17 metres of the southern lot boundary, the north elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the southern lot boundary, the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.25. Lot 138

The future dwelling on Lot 138 has a 6 metre fire trail along the rear lot boundary and a minimum 14 metre building setback from the rear lot boundary, totalling 20 metres separation. There is also a minimum 20 metre separation required from the covenant area within the lot.

- If the dwelling is within 17 metres of the rear lot boundary or within 23 metres of the covenant area, then the northwest elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is 17 metres or more from the rear lot boundary and 23 metres or more from the covenant area, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.

6.26. Lots 142

The future dwelling on Lot 142 is required to have a minimum separation of 20 metres from the covenant area within the lot and from the northern lot boundary.

- If the dwelling is more than 23 metres from the covenant area and northern lot boundary, then the whole building is to be constructed to a BAL-12.5 rating, requiring Sections 3 & 5 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant area and more than 23 metre from the northern lot boundary, then the west (front) elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the northern lot boundary and more than 23 metre from the covenant area, then the south elevation of the dwelling can be constructed to BAL-12.5 Bushfire Attack Level, requiring Sections 3 and 5 of AS3959-2018 to be applied, while the remainder of the building must be constructed to a BAL-19, requiring Sections 3 and 6 of AS3959-2018 to be applied.
- If the dwelling is within 23 metres of the covenant area and northern lot boundary, then the whole building is to be constructed to a BAL-19 rating, requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.27. Lot 143

The future dwelling on Lot 143 is required to have a minimum 20 metre separation from covenant/conservation areas.

The future dwelling is to be constructed to a BAL-19 construction rating requiring Sections 3 & 6 of AS3959-2018 to be applied.

6.28. Lots 37, 44, 45, 58-61, 66, 67, 97-105, 110-115, 120-127, 144 & 145

Lots 37, 44, 45, 58-61, 66, 67, 97-105, 110-115, 120-127, 144 & 145 have a low hazard rating.

Under the Gatton Shire Planning Scheme V.2, June 2007, Part 5, Division 4, Section 5.14, a site with a Low hazard rating does not require assessment under the bushfire requirements of the National Construction Code of Australia or under the Australian Standard (AS3959) for *Construction of Buildings in Bushfire Prone Areas* and therefore no specific level of construction would be required in relation to bushfire for those lots.

7. Provision of Adequate Water Supplies

The area of the proposed development is to be serviced by reticulated water supplies with the inclusion of fire hydrants for firefighting purposes. These services are to comply with the relevant standards as required by the local authorities, including a minimum pressure and flow of 10 litres a second at 200kPa or that which is able to be supplied by the local reticulated network.

Fire Hydrants are to be installed in accordance with the *Fire Hydrant and Vehicle Access Guidelines for residential, commercial and industrial lots*, Queensland Fire and Emergency Services, 2015, unless otherwise specified by the relevant water authority.

8. Provision of Fire Fighting Infrastructure

Buildings should have external hose cocks and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil. Residents should maintain good access around their homes for fire suppression activities by fire authorities.

9. Local Fire Brigades

The subject property is currently in the Gatton Springdale Rural Fire Brigade district and they would be responded on a 000 emergency call. Urban fire appliances would be responded in the event of a structural fire or specialised structural protection being required.

10. Improved Community Awareness

Minimising ground fuel and regrowth is the easiest way of reducing bushfire hazard on rural lots. Owners can assist in the mitigation of these bushfires by the removal of ground fuels prior to the bushfire season.

It is recommended that a copy of the fire management plan be placed on display at any sales office, and a copy of the plan including Appendix 3 be given to the purchasers of lots to provide them with the necessary information required for the management of their property and the building application process.

A copy of the plan should be retained by residents and passed on to future residents including Appendix 3 on "being prepared" to assist them in minimising the risk of bushfire damage. It is recommended that regular liaison with the local fire brigade takes place as a way of being informed of danger periods.

The Bushland open space is a very sensitive ecosystem and could be altered drastically if not cared for properly. Residents can assist in maintaining this fragile ecosystem by preventing unwanted fires from encroaching into the parkland, ensure that dumping of rubbish does not degrade the area and that exotic plant species do not invade the bushland. Hot fires on a regular basis will degrade the bushlands biodiversity.

It would be recommended that residents prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at www.ruralfire.qld.gov.au. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

11. Summary of Recommendations

- The fire trails are to be 6 metres in width with 4 metres formed. All fire trails would be low impact preferably with a mowed or slashed surface which would minimise disturbance or erosion.

- Where the new allotments adjoin bushland (i.e. northern and eastern boundaries and retained internal parkland), building envelopes are to be established on each lot that will provide for appropriate setbacks from boundaries to allow the implementation of Asset Protection Zones (radiation zones) of a 20 metre minimum between housing and the bushland areas.

- Dwellings on conservation lots are to have a minimum separation of 20 metres from the conservation bushland areas.

- Where roadway separation exists between the allotment and bushland, and the road reserve width is less than 20 metres, the dwelling must have a setback from the roadway boundary that ensures a minimum 20 metre separation from bushland for the dwelling.

- Dwellings should be located as close to roadways as practical, to provide short direct access, but allowing for minimum separations as outlined in Section 4 of this report.

- As a minimum all dwellings should be provided with a 10 metre inner APZ around the building, as outlined in Appendix 2 of this report, with a further 10 metre outer APZ where ground fuel is managed and mid storey fuel is thinned. Any remaining land in the allotments, outside the covenant areas, is to also be managed as an outer APZ. APZs overlap with neighbouring radiation zones where housing is located close enough to provide each other protection. Fire trails and roadways can form part of an APZ. Basins 5 & 7, located within allotments are still to be managed as APZs.

- Driveways are to be managed with low ground fuel, low branches along driveways should be removed to a height of 2 metres and branches overhanging driveways should be removed to a minimum height of 4 metres.

- Owners of land with covenanted areas are to maintain the covenanted area by the removal of non-endemic grass and weed species within the covenanted area to reduce the risk of bushfire damage to their properties or the local ecosystems.

- All previous or future cleared timber and foliage or accumulated rubbish should be removed from the site or mulched and not simply moved aside as this will result in a concentrated area of fuel loading which will increase the potential bushfire hazard from that direction.

- Open space parkland areas should be managed by the removal of non-endemic grass and weed species within the parkland to reduce the risk of bushfire damage to properties or the local ecosystems.

- If the development is to take place in stages, care should be exercised to ensure the developed stages are not threatened by bushfire from the undeveloped stages, by providing a minimum 20 metre managed vegetation buffer.

- Dwelling are to be constructed in accordance with AS3959-2018 as outlined in Section 6 of this report.

- Buildings should have external hose cocks and hoses that are positioned so water supply is capable of reaching to all parts of the building. All water lines are to be covered by at least 300mm of soil. Residents should maintain good access around their homes for fire suppression activities by fire authorities.

- It is recommended that a copy of the fire management plan be placed on display at any sales office, and a copy of the plan including Appendix 3 be given to the purchasers of lots to provide them with the necessary information required for the management of their property and the building application process.

- A copy of the plan should be retained by residents and passed on to future residents including Appendix 3 on “being prepared” to assist them in minimising the risk of bushfire damage. It is recommended that regular liaison with the local fire brigade takes place as a way of being informed of danger periods.

- It would be recommended that residents prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at www.ruralfire.qld.gov.au.

12. Conclusion

With the appropriate APZs as outlined in Appendix 2 and Section 5, adequate water supply, good access provisions and minimising of ground fuels, the risk of bushfire damage can be managed and improve the safety of residents and fire services in attending to a bushfire threat.

This plan remains current for a period of 5 years, until 2029, at which time it should be subject to review to take account of changing land use and vegetation patterns. Any major bushfire event affecting the subject site should also trigger a review to determine effectiveness of protection measures and annual hazard reduction initiatives.

Ultimately, persons living in a bushfire prone area must take the precautions necessary to protect themselves, their families and their homes if Brigades are stretched and are unable to attend immediately.

If you require any further assistance, please do not hesitate to contact this office.

Brett Bain, MDIA, MRFAQ
Lead Bushfire Consultant.

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Council Planning Scheme

Appendix 1

LEGEND

- ASSET PROTECTION ZONES *(RADIATION ZONE 20m)*
- (70) EXISTING TREE WITH TREE PROTECTION ZONE *(FURTHER DETAILED SURVEY REQUIRED)*
- EMERGENCY VEHICLE ACCESS EASEMENT
- *Conservation Area (Private Land)*

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PARK LAKE ADARE
SALES PLAN

of Lot 94 on CA311434 & Lot 96 on SP225226
147 Adare Road, Adare QLD 4343
Client - Park Lake Adare Pty Ltd atft Park Lake Adare Unit Trust

Scale 1:5000 – Lengths are in Metres.

50 0 50 100 150 200 250 300 350 400 450 500 550 600 650 700

L.A.	LOCKYER VALLEY
SCALE	1:5,000 @ A3
DATE	28/03/2024
SHEET	1 of 1
DRAWING NO.	001762_SALES_REV C

Appendix 2: Asset Protection Zones

Appendix 2 on Asset Protection Zones (APZs) is included in this report as a guide on how to implement and maintain Asset Protection Zones.

What is an APZ

Generally, buildings or infrastructure located in a bushfire prone area are required to have a minimum separation between the buildings/infrastructure and the unmanaged hazardous bushland (hazardous bushland being bushland assigned a Medium, High or Very High bushfire hazard rating). This separation is known as an Asset Protection Zone (APZ) and is also sometimes referred to as a Radiation Zone or bushfire buffer.

The Asset Protection Zone can include roadways, fire trails, car parking, driveways, active park and managed areas (i.e. lawns and correctly designed landscaping). For example, on rural allotments the APZ would most often be provided by managed areas with a Low hazard rating (lawns and gardens), whilst in an area of small residential allotments adjacent to large areas of bushland the APZ may consist of a roadway or fire trail possibly supplemented by managed areas within the allotments.

An APZ provides an area for bushfire impact mitigation and a defendable space for active fire suppression. An APZ;

- Allows the radiant heat from a bushfire in adjacent bushland to at least partially dissipate before impacting on buildings or infrastructure, thereby mitigating the bushfires impact on the asset,
- Reduces the chance of direct flame contact on buildings,
- Usually includes vehicle access or firefighter pedestrian access,
- Provides an area of defendable space around the asset, allowing firefighters room to work safely and defend structures during direct, indirect and defensive suppression strategies,
- Provides a work area and break for hazard reduction burning activities to be conducted, if desirable.

Dimensions of APZs

Often the APZ will be split into two zones, an ‘inner APZ’ and ‘outer APZ’, particularly where the APZ is a managed vegetation area. As a general rule of thumb the first ten metres around the building would be an inner APZ while the remainder of the required separation would be an outer APZ, however the exact dimensions are those stipulated in the bushfire mitigation plan, not the generalised examples stated in this appendix, as it may vary depending on individual site conditions. The dimensions may vary depending on site factors, for example with a building on a slope, the APZ may be less on the upslope side of the building than on the downslope side. A change in vegetation type or size of vegetation area that the building is exposed to may also vary the dimensions of the APZ. An extended outer APZ is also sometimes used to extend the outer APZ in consideration of slope. The extended outer APZ is usually managed the same as the outer APZ.

Slopes in APZs

Generally, APZs require ongoing vegetation management and therefore need to be located where management can be physically possible. APZs on public land should not include slopes with a grade greater than 1:4, on private land APZs should avoid slopes greater than 1:3. For example, where a roadway (including road verge) provides the required separation, the road verge cannot consist of a batter greater than 1:4. Where a retaining wall is located within an APZ, access to all levels need to be provided permitting management of the entire APZ.

Vegetation in APZs

It should be noted that APZs do not necessarily call for complete clearing of all vegetation, as tall canopy tree retention, for example, is a common feature within outer APZs. The management of fuel levels within these zones is designed to reduce the intensity of bushfires before the bushfire impacts on assets such as buildings and property. The correct and continued maintenance of fuel levels within a buildings APZ may result (depending on factors such as terrain, fuel types and climatic conditions) in reduced flame height, a slowing of the rate of spread of the fire and a reduced risk of direct or radiant heat attack on buildings and other property assets.

The following is a guide for vegetation within APZs, however where there is an inconsistency between the main body of the Bushfire Mitigation Plan (BMP) and this Appendix, the requirements of the BMP applies.

The inner APZ;

- Trees have less than 15% canopy cover at maturity and canopy is discontinuous.
- Trees do not touch or overhang buildings.
- Near surface fuels (shrubs, ground covers) are not to be planted underneath tree canopies, are less than 300mm in height and have less than 10% plant cover.
- Lawns/grass is kept to less than 100mm height.
- No accumulated Leaf litter or fallen timber.

An example of 15% canopy – If the tree species being used have a maximum 5 metre diameter canopy at maturity, then there could be up to one tree per 166m^2.

The outer APZ;

- Trees have less than 30% canopy cover at maturity.
- Trees do not touch or overhang buildings.
- Near surface fuels (shrubs, ground covers) are not to be planted underneath tree canopies, are less than 300mm in height and have less than 20% plant cover. Gaps between fuel patches are greater than the size of the patches.
- Lawns/grass are kept to less than 300mm height.
- No fallen timber.
- Leaf litter is not allowed to accumulate to more than 5t/Ha (10mm deep).

An example of 30% canopy – If the tree species being used have a maximum 5 metre diameter canopy at maturity, then there could be up to one tree per 83m^2.

General for both zones;

- No mulch, woodchip, bark or leaf litter build-up against structures or flammable fencing.
- Shrubs and ground covers should not be species that accumulate a lot of dead fuel underneath.
- Creepers used as ground cover must not be climbers.
- Creepers should be low broadleaf succulents, such as Myoporum ellipticum.
- Tree selection is not to include fibrous bark trees or ribbon bark trees.
- Tree species have a well-defined trunk with upper canopy, not short bushy trees with foliage from ground to canopy, providing ladder fuels. Trees have branches lower than two metres removed, providing separation between canopy and ground fuels.
- Weed growth is removed.

The above criteria for an outer APZ, would approximately allow up to 8t/Ha overall fuel load in the outer zone.

Plant/Canopy cover is defined as the amount of ground blocked out by that fuel layer if viewed while looking straight down from above. Each plant is considered opaque – any ground within the perimeter of the plant cannot be seen.

Pebbles, gravel or scoria may be useful substitutes for garden mulch. Pathways and gravel areas in addition to lawn can assist in separation of plantings resulting in less continuity of fuels.

How to select the correct plant species for APZs

In selecting the correct plant species to use for landscaping in a bushfire prone area, consideration needs to be given to plant moisture content, branching patterns, texture, foliage density, leaf type, bark type, retention of dead material, and presence of oils, waxes and resins.

As a guide to landscaping and gardening in a bushfire prone area, the document 'Landscaping for Bushfire' produced by the CFA Victoria, is a useful guide on plant selection, garden design and ongoing maintenance. It can be found at https://www.cfa.vic.gov.au/plan-prepare/landscaping. Section 5 of the document provides a good description of the above characteristics and which are good or bad, and Section 7 of the document provides a plant selection key, which is a step by step guide on how to select plants based on those characteristics and should be used when choosing what plants to have in APZs.

There are a number of different terms used to identify suitable plants, some of the more common ones include Fire Resistant, Fire Retardant and Firewise. Not all of these are correct and such plant lists are often confused by some as to their purpose.

'Fire Resistant Plants' is a term that describes plant species that survive being burnt and will regrow after a bushfire. They are resistant to being killed by a bushfire, but not to being burnt. Therefore, they may be highly flammable and inappropriate for bushfire risk areas. You can often find lists of 'Fire Resistant Plants' being used for the wrong purpose due to people not understanding this, so beware, it does not necessarily mean low flammability.

'Fire Retardant Plants' can be confused by some as being plants that will not burn. All plants will burn under the right conditions, so don't be misled. Plants with low flammability are good, but can still burn, which is why positioning, planting density and ongoing management is also just as important.

'Firewise Plants' is the term used in the 'Landscaping for Bushfire' document to describe suitable lower flammability plants.

Other Features within APZs

Non-flammable features such as tennis courts, in-ground swimming pools, dams, driveways, paved or concreted areas, uncovered patios and non-combustible water tanks may be located within the APZs. (Note: a timber deck around a pool, is not non-flammable and if connected to the building is part of the building.)

Retaining walls and fencing within APZs should preferably be non-flammable.

Piles of timber, firewood and other flammable material should not be stored within the APZ unless shielded from bushfire.

Management of APZs

Management requirements in the APZ include:

- Tree branches below two metres being removed.
- Selective removal of tree saplings.
- Fallen Timber, bark and twigs being removed.
- Leaf Litter being controlled to the appropriate level, which can be achieved by raking or using a blower/vac.
- Removing of weed growth regularly, especially woody weed.
- Regular mowing, slashing or grazing.
- Trimming back of shrubs and ground covers
- Regular watering to keep lawns and vegetation lush and green at all times, particularly during drought, when fires are more likely to happen.
- If poisoning is used, ensure dead material has time to collapse and begin to rot prior to the onset of fire season and not provide standing dead material as fuel for a potential bushfire.

Ongoing management of vegetation in the APZ is just as critical as getting the right type of plants and correct landscape design.

Building construction ratings (or BALs) are calculated with consideration of the amount of separation between the building and hazardous bushland. Not properly maintaining the APZ separation may mean the designated construction of the dwelling is not sufficient and could compromise building survivability in the event of bushfire. This could also lead to issues with insurance claims in the event of building damage or loss.

Appendix 3: Being Prepared

Knowing how to prepare your property for bush fire, both pre-fire and during a fire, can assist in protecting people and property. It can also alleviate a lot of the stress and panic and the feeling of helplessness that is commonly felt by the inexperienced and by the ill-prepared.

It is generally accepted that South East Queensland does not experience the same degree of extreme fire conditions as the southern states of New South Wales, Victoria and South Australia. Having said this it is also accepted that this State's bushland experiences a relatively regular fire regime. From time to time conditions may occur that will institute a serious and potentially destructive fire. These conditions can be recognised and precautions taken. It must be remembered that during extreme fire conditions the fire services may be stretched to the limit and may not be able to respond immediately to your particular emergency. Fire trucks and fire fighters are a limited resource, so it is important that they are deployed in an appropriate manner to best manage the fire. The Queensland Fire and Rescue Service do not guarantee a fire truck will be available to defend every structure during a large bushfire. So, it would be desirable to be as prepared and self-reliant as possible to protect yourself, your family and your assets. It is not difficult if appropriate preparation is undertaken, and the following information is provided to be of some assistance.

1. Conditions that may lead to a Serious Fire:

1.1. Higher than average air temperatures for prolonged periods.

1.2. Large and very dry fuel loads.

1.3. Prolonged dry spell with little or no rain resulting in low soil moisture content.

1.4. Very low relative humidity, i.e. there is very little moisture in the air.

1.5. Strong and gusty winds, usually from the north through to the west contribute to increased fire hazard. The longer these winds continue the drier the conditions become, and the higher the risk of serious fire.

Observation of local weather conditions past and present will give the best indication of the potential intensity of a fire at any given time or place.

Notification of potential bushfire conditions are available from the Queensland Rural Fire Service and Local Brigades, in the form of Fire Danger Ratings often seen on roadside signs, Advice Messages, Watch and Act Messages and Emergency Warnings. More information on these information sources, where to find them and what they mean, is available on the Rural Fire Service Website www.qfes.qld.gov.au/bushfires or through the local Fire Brigade.

2. Basic Fire Behaviour.

Having some idea of what a fire is likely to do in your local area, will help you make the right decisions and give you the confidence to deal with an approaching fire if necessary. Following are some basic fire behaviours.

2.1. Fire will travel faster and hotter uphill. The steeper the slope the faster the rate of spread, in some cases allowing little time to react. The speed of a fire will double for every 10 degrees of upslope.

2.2. Fire will usually travel relatively slower downhill even with reasonably high fuel loads, which will give more time to prepare. The speed of a fire will halve for every 10 degrees of down slope.

2.3. A fire will generally travel faster and at higher intensities with a wind behind it. The stronger the wind, the faster the rate of spread. Likewise, a fire will slow considerably when burning against the wind in some cases it may even go out.

2.4. The fire will usually burn at a higher intensity and spread faster during the hottest times of the day and tend to slow down considerably as the evening approaches and air temperatures drop.

2.5. The greater the supply of dry ground fuel available to the fire, i.e. grass, dry leaf litter, hanging bark and twigs, the greater the intensity of the fire. If the ground fuel is minimised the intensity of the fire reduces considerably and so does the personal risk and the potential for damage.

2.6. If ground fuels are kept relatively low the chances of a fire progressing into the treetops (crown fire) would be considerably reduced within the Queensland coastal bushlands. For a fire to progress into the treetops ground fuels and elevated fuels must be present providing a 'ladder' of fuels from ground level to treetop. Control of these fuels is the best way of minimising fire intensity and therefore limiting the destructiveness of a bushfire.

Talk to neighbours that have been present during previous bushfires or consult the local Fire Brigade to develop an understanding of usual fire behaviour for your specific location.

3. Preparing for the bushfire season.

Most cases of damage to property are caused by radiated heat, direct flame contact or most commonly by burning debris or sparks landing in, on, or around buildings and starting small spot fires which if not attended to may destroy the property long after a fire front has passed. There are many steps that should be taken prior to the onset of a fire season to help protect your property.

3.1. Keep ground fuel cleared from around buildings such as long dry grass, branches, dead leaves, bark and thick undergrowth.

3.2. Remove elevated fuels, such as hanging bark and fallen debris hung up on lower branches.

3.3. Ensure fire breaks/trails/buffers are checked and maintained, even a well-watered lawn can be an effective firebreak.

3.4. Flammable material around buildings should be kept well clear, such as firewood piles, rubbish, fuels, hazardous materials, plant pots, boxes, paper, patio and garden furniture.

3.5. Ensure flammable materials are not stored in open areas under the building.

3.6. Make sure that rainwater gutters are kept clear of leaf litter build-up. Consider a method of blocking off down pipes so gutters can be filled with water during a fire to extinguish sparks landing in gutters. There are commercially made products available or you can create your own.

3.7. Make sure that the roofing is well secured, as winds created during a fire may lift roofing and allow the entry of burning-embers into the roof space. Also clear any leaf litter or debris build-up from roof areas.

3.8. All windows and vents should be screened with fine wire mesh and all roof areas closed in to prevent entry by sparks.

3.9. Ensure gas tanks have their emergency relief valves facing away from the building (this includes barbeque bottles).

3.10. Make sure of reserve water supplies. Power frequently fails during a fire. If petrol or diesel pumps are available, make sure they and associated hoses and fittings are in good working order.

3.11. Ensure your bushfire survival kit is up to date and complete.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to fire season and what to do during a bushfire event. This information can be found at www.qfes.qld.gov.au/bushfires or obtained from your local fire brigade.

4. Green Fire Breaks

Added protection from bushfire can be achieved by establishing green fire breaks which include green lawns, trees arranged to create a shield to catch sparks or fire brands or the expanding of tropical rainforest species. Excess rainwater or tertiary treated wastewater could be stored and used for this purpose during dry periods to maintain the green fire breaks. Trees and shrubs not subject to drought stress will cope better during bushfires. The higher the moisture content in the plant the slower it burns. Therefore, by keeping the surrounding area green and low in dry ground fuel, the intensity of an approaching fire will be reduced, and the risk of spot fires minimised.

5. Personal Protection

5.1. If you plan to evacuate, make sure you do so early, long before the fire front arrives. Evacuating at the very last moment results in the majority of deaths at bushfires. People remaining to fight the fire need to be physically and mentally fit to do so.

5.2. Those staying to protect the property should make sure they protect themselves from radiant heat, flying embers, smoke and most importantly heat stress. Protection measures should include the following:

- Long trousers and long sleeve shirt made of wool, denim or cotton (no synthetics)
- Woollen socks and sturdy work boots for foot protection
- Goggles for eye protection
- A good pair of work gloves to protect hands from burns
- A smoke mask or a damp cloth (non-synthetic), to cover your nose and mouth to protect you from inhaling smoke and embers.

- Have plenty of drinking water available to protect against dehydration (not refrigerated as this can cause cramping).

5.3. During the fire

When a fire is approaching and given that you have already carried out your pre-fire precautions, established adequate buffers, implemented mitigation measures and established the degree of risk to your property, protection from the actual fire should be relatively straight forward.

5.3.1. Dress in the appropriate clothing and be sure to drink water regularly.

5.3.2. Fill up bathtubs, sinks, buckets, laundry tubs etc. in case of blackouts.

5.3.3. Close doors and windows.

5.3.4. Close gaps under doors and windows with wet towels.

5.3.5. Block up down pipes, wet down roof, walls and gardens, paying particular attention to the side the fire is approaching from.

5.3.6. Have a battery-powered radio on hand to listen for information about the fire's progress from local radio stations.

5.3.7. Patrol your property while the fire is approaching and take shelter inside as the fire front passes. Then continue patrolling the property for many hours after it has passed, to ensure that any spot fires or smouldering debris do not get a chance to develop into a major fire, paying particular attention to the roof cavity of your buildings. Smouldering embers have been known to start fires hours or even days after the initial passing of the bushfire front.

The Queensland Fire and Rescue Service provide detailed lists for preparation prior to the arrival of a bushfire and what to do during a bushfire event. This information can be found at www.qfes.qld.gov.au/bushfires or obtained from your local fire brigade.

6. Further Information?

The local fire brigade is a good source of local district knowledge, they also have pamphlets and literature produced by the Queensland Fire and Rescue Service available. Most brigades will also be happy to advise local residents.

The information provided above is only a basic guide. Further and more details information is available from the Queensland Fire and Rescue Service. It would be recommended that residents in bushfire prone areas prepare a 'Bushfire Survival Plan', which is available from the Queensland Rural Fire Service website at www.qfes.qld.gov.au/bushfires. The 'Bushfire Survival Plan' document provides information on Bushfire Danger Ratings, Community Warning Information, how to prepare your property, what to do in the event of a bushfire and what to expect. The Bushfire Survival Plan should be updated annually. Further information is also available through the Prepare•Act•Survive brochure also available on the Rural Fire Service website. For further information contact your local Fire Brigade for assistance or phone 1300 369 003.

Appendix 4: Long Driveways

Recommendations for a long driveway

Long and/or steep driveways can pose a number of problems in relation to access for fire services or the evacuation of people when a bushfire threatens. Steep sites can be difficult for large fully loaded tankers to negotiate in a timely manner during an emergency, which may occur at any time of the day or night. Therefore, some consideration to the requirements of emergency services needs to be implemented during the planning and construction stages of long, winding or steep driveways.

1.1. Driveways should preferably be constructed to a minimum of 4 metres wide, be able to be negotiated by up to a 20 ton, 2 wheel drive vehicle, with relatively low ground clearance.

1.2. To assist access for urban fire appliances in the event of a structural fire, gradients should be no greater than 1 in 8, 12.5%, which may increase to 1 in 5 20% over a maximum distance of 50m at a time. The driveway should have a maximum cross slope of 3%. Where a driveway gradient exceeds 1 in 5 (20%), a bitumen or concrete surface should be used. These are Queensland Fire and Rescue Service, Southeast Region guidelines only, and Queensland Streets is the official criteria.

1.3. A clearance height from overhanging trees or other obstacles should be at least 4.8 metres.

1.4. The ground fuel should be kept to a minimum along each side of the driveway in particular on the down slope side, to minimise the risks posed to services trying to access your property during an emergency situation. Ideally ground fuel should be reduced for a minimum of 3 metres to the down slope side of the driveway and 2 metres to the upslope side. This fuel reduction zone should be maintained within the property boundary.

1.5. If the driveway is especially long, clear areas for passing should be established at a maximum of 200 metre intervals and at the top and bottom of any steep slopes.

1.6. Turning areas should be established at the building. A minimum turning circle should have an 8 metre radius or equivalent Y, T or hammerhead area for the steeper or restricted sites where a turning circle is not possible.

1.7. Good access and safety areas around buildings should be established, for use in the event of driveway access and egress being denied during a fire event.

1.8. Driveways of a long nature should also be well identified and kept in good condition, as time saved in an emergency may save lives.

1.9. Where emergency water supplies are located on a property, uninterrupted access should be maintained at all times and be clearly marked for quick identification by fire services in times of emergency.

1.10. Care should be exercised in the construction of driveways to prevent erosion as this may restrict the movement of heavy vehicles.

Appendix 5: Fire Trails

Recommendations for Fire Trails

Fire trails can be a very effective tool in the management of bushland, for weed control, hazard reduction requirements, prescribed burns and fire suppression activities. A good well maintained trail network can effectively enhance and maintain desired ecosystems, while providing added safety for the protection of life and property. The following is some ways in which fire trails can be constructed and maintained to improve their viability.

1. Fire trails should preferably be constructed to a cleared width of 6 metres and a formed width of 4 metres, and be able to be negotiated by light and medium 4 wheel drive fire appliances.

2. They should preferably have a maximum gradient of 25%, a maximum cross slope of 5%, avoid large cut and fill and avoid sharp corners.

3. Fire trails up to 25% can be of compacted earth surface designed with water shedding devices, such as pipes under trail, whoa boys or change of gradients, to prevent washouts or gouging of slopes. It would also be advantageous in some cases if grass coverage can be established, which with periodic slashing or mowing will assist in preventing washouts.

4. Fire trails should have access at each end and multiple access/egress points where possible.

5. Fire tails are to have passing and turn around areas at maximum intervals of 400 metres.

6. Periodic management of ground fuel levels along the edges of fire trails should be implemented to at least one metre each side to improve accessibility during a fire event.

7. Trees alongside fire trails should have low branches removed to a height of 2 metres to assist in preventing fire from climbing into treetops. Branches overhanging fire trails should be removed to a minimum height of 4 metres to ensure access by fire vehicles.

8. Fire trails should be inspected each year prior to fire season, to ensure their condition and carry out remedial work if required.

9. Dead or dying trees that are close to fire trails and may pose a risk to fire services should be removed.

10. Fire trails should not be seen as fire breaks. They are an aid in the management of fuel levels and fire suppression activities.

11. Fire trails should be identifiable to land managers and fire services by signage and map records. Where a fire trail network exists, intersections should also be identifiable.

Bushland Protection Systems
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Fire is a part of nature. Its effects can be catastrophic and fire can never be totally eliminated, however there are steps that can be taken to reduce the chances of uncontrolled fires occurring and the risk to life, property and the environment, in the event of uncontrolled fires. This is what we concentrate on, how the threats from bushfire can be minimised. There are many methods to do so, however deciding which method/s is best to use can be a complex decision to make. There are so many factors to consider such as ecological values, biodiversity, fire history, availability of resources, cost effectiveness and public awareness just to name a few. No guarantees can ever be given when dealing with Mother Nature, with ever increasing complexities it has now become a specialist field to be able to create plans to try and minimise the risk from bushfire. Ultimately it is a community responsibility to protect the environmental values, life and property in their area

COMPANY PROFILE

Bushland Protection Systems Pty Ltd (BPS) is a leading Bushfire Management Consultancy firm in Queensland, with many clients, ranging from private landowners to multi-national companies and Government bodies.

BPS consultants began operating as Bushfire Management Consultants with the introduction of the Gold Coast Bushfire Management Strategy in 1998 and spread their operations across the state with the implementation in 2003 of the State Planning Policy for mitigating the adverse impacts of flood, bushfire and landslide.

During that time over 3500 projects have been successfully completed, including large residential estates such as Coomera Waters, Spring Mountain, Pacific Pines, Coomera Springs, Observatory, Highland Reserve, Delfin Woodlands & Yarrabilba as well as commercial or Government project sites such as Paradise Country, Wacol Police Academy, Numinbah Correctional Facility, Silkwood Steiner School, Canon Hill Community Links Project & Griffith University.

With a strong background in bush fire fighting and involvement with numerous industry bodies, Bushland Protection Systems continues to deliver realistic and cost effective advice and solutions to provide higher levels of safety for the community, improve wildfire suppression and mitigation options for emergency services and land managers, while maintaining and improving environmental values for the future.

Our Consultants are registered with the Rural Fire Association of Queensland (RFAQ) as Level 2 Accredited Bushfire Practitioners.