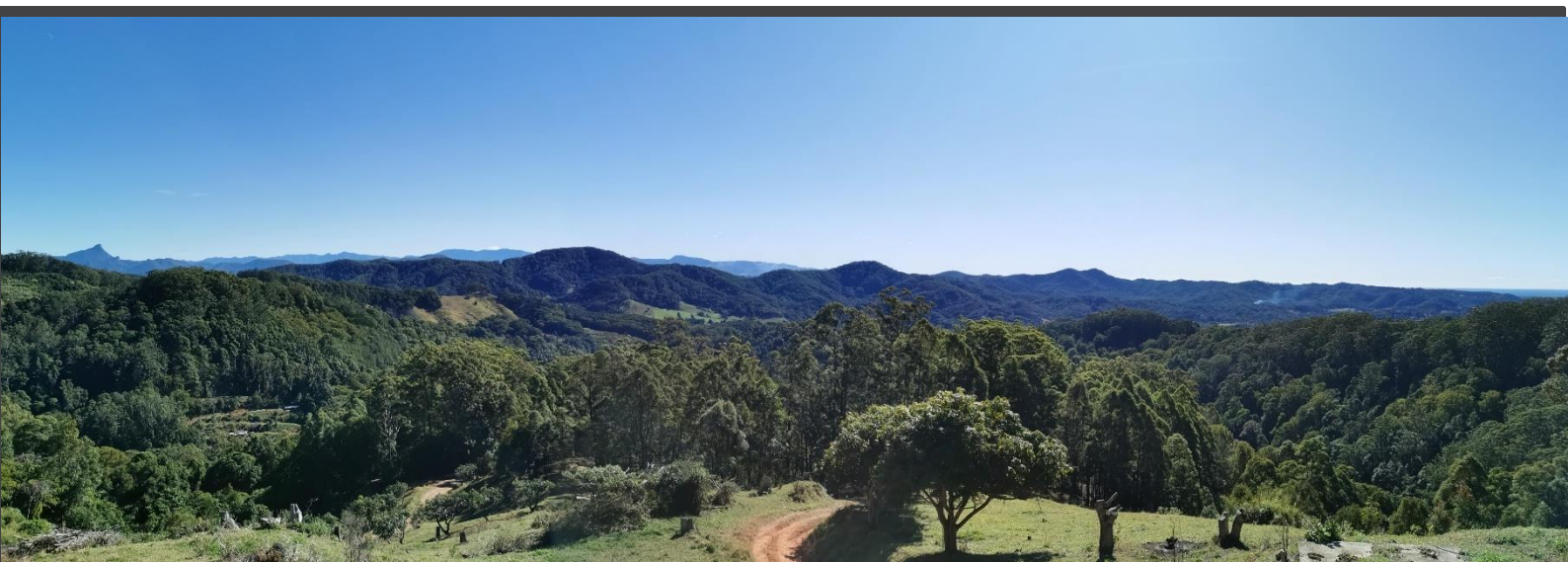




Bushfire Risk Assessment

Subdivision



**Proposed
Development:**

Small residential subdivision of one (1) lot into two (2) lots

Location:

Lot 12 DP6081
49 Pullen Street
Woolgoolga NSW 2456

Client: Vision Town Planning

Our Ref: 2301VIS2057

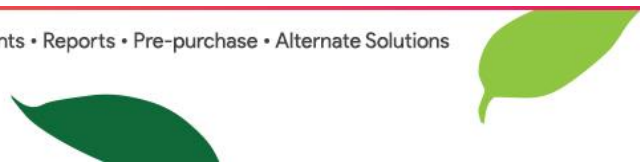


Date of Issue: 5 April 2023

Report prepared by **Melanie Jackson**

Grad Dip (Bushfire Protection); B.App.Sc (EnvResMgt)

BPAD-Level 3 Accredited Practitioner & Member of the FPA Australia



‘Prepare—Act—Survive’

In the Event of an Emergency Call:

‘000’



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EXPIRY

The bushfire risk assessment and resulting BAL rating contained in this report should not be relied upon for a period extending 6 months from date of issue. If this report was issued more than 6 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report should be issued.

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EXECUTIVE SUMMARY


This Bushfire Risk Assessment relates to a proposed development located at:	Lot 12 DP6081 49 Pullen Street; Woolgoolga NSW 2456
Client/s:	Vision Town Planning
Site inspection date:	4 February 2023
Proposed development:	Small residential subdivision of one (1) lot into two (2) lots
Site Plans by:	Plans by Abbott & Macro; 19/12/2022 A full set of plans shall be provided by the applicant to accompany the DA. All design and site plans must ensure compliance with the minimum building setbacks in relation to this development as proposed and the recommendations contained herein.
Is there a suitable building location envelope within each proposed lot below critical radiant heat flux limits of $\leq 29\text{kW/m}^2$?	YES – all proposed new lot/s incorporate an indicative building location envelope/s (BLE) with setbacks which remain below the critical radiant heat flux limit of 29kW/m^2 .
Does this development satisfy the Aims and Objectives of PBP?	YES
Are performance solutions presented herein?	NO
Does this development require referral to the NSW Rural Fire Service as per s.100B Rural Fires Act 1997?	YES – requiring a Bush Fire Safety Authority (BFSA) for integrated development.
This assessment has been prepared and Certified by Melanie Jackson BPAD-Level 3 Certified Practitioner; FPAA Cert. No: 21977	



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ABBREVIATIONS

Abbreviation	Description
APZ	Asset protection zone
AS3959	Australian Standard – Construction of Buildings in Bushfire Prone Areas
BAL	Bush fire attack level
BCA	Building Code of Australia
BE	Building envelope
BFPL	Bush fire prone land
BFPL Map	Bush fire prone land map
BFSA	Bush fire safety authority
BPM	Bush fire protection measure
DA	Development application
DCP	Development control plan
EP&A Act	<i>Environmental Planning & Assessment Act 1979</i>
FFDI	Forest fire danger index
GFDI	Grass fire danger index
IPA	Inner protection area
kW/m ²	Kilowatts per metre squared
LEP	Local environmental protection plan
NSW RFS	NSW Rural Fire Service
OPA	Outer protection area
PBDB	Performance based design brief
PBP	Planning for Bushfire Protection
RF Act	<i>Rural Fires Act 1997</i>
RF Reg	<i>Rural Fires Regulation 2022</i>
SEPP	<i>State Environmental Planning Policy</i>
SFPP	Special fire protection purpose
SFR	Short fire run



1 INTRODUCTION

Bushfire Risk Pty Ltd was engaged by the client/s to conduct a Bushfire Risk Assessment in support of a Development Application (DA). The purpose of the assessment is to determine category of bushfire attack and critical radiant heat flux limits in relation to the proposed development.

The development shall be carried out on the lot/s referred to as the 'Subject Site' (Figure 1) and where applicable, existing or future dwellings shall be sited within a Building Envelope which shall be referred to as a 'BE' throughout this document.

1.1 Subject Site

Address: Lot 12 DP6081 of 49 Pullen Street Woolgoolga NSW 2456.



Figure 1: Aerial image of the subject site and surrounds (Source: Nearmap 2023)

1.2 Proposed Development

Small residential subdivision of one (1) lot into two (2) lots (Ref. Table 1).

It is noted suitable BEs shall be positioned within each new lot where the radiant heat flux limits are unlikely to exceed 29kW/m^2 and direct flame contact negated.

Table 1: Existing & proposed lot size

Existing lot size	Proposed lot size – Lot 1	Proposed lot size - Lot 2
1509.2m ²	906.7m ²	602.5m ²

1.3 Legislation

1.3.1 Building on Bushfire Prone Land

The National Construction Code (NCC) contains Performance Requirements and Deemed-to-Satisfy provisions relating building on Bushfire Prone Land (BFPL). Construction on BFPL must comply with AS3959-2018 – Construction of buildings in bushfire prone areas (AS3959) or the National Association of Steel Framed Housing (2014) Steel Framed Construction in Bush Fire Areas (NASH Standard) as varied in NSW. These requirements are considered Deemed-to-Satisfy solutions, however, do not extend to BAL-FZ or where modified by specific conditions of the relevant development consent.

1.3.2 Bushfire Prone Land

The subject site is mapped as 'Bush Fire Prone Land' (BFPL) under s.10.3 Environmental Planning and Assessment Act 1979 (EPA Act), triggering the legislative requirements for building on bushfire prone land is applicable (Figure 2).



Figure 2: BFPL Map (Source: NSW Government 2023)

1.3.3 Development requiring a Bushfire Safety Authority (BFSA)

Proposed sub-divisions and special fire protection purpose (SFPP) developments as defined in PBP require approval from the NSW RFS in the form of a bushfire safety authority (BFSa) under s.100B *Rural Fires Act 1997*. Such developments are considered 'Integrated development' under s.4.46 of the *EP&A Act 1979*.

1.3.4 Residential and Rural Residential Sub-Division

The following bushfire risk assessment was undertaken pursuant to section 5 – Residential and Rural Residential Subdivisions (PBP).

1.3.5 Existing Dwellings

While all new dwellings within a subdivision must comply with PBP, the existing dwelling/s located on the land is likely to benefit from BPMs. Therefore recommendations herein may include upgrading existing structures to provide ember protection and water supplies for firefighting purposes.

1.3.6 Environmental, Ecological and Aboriginal Features

The scope of this bushfire report does not include an environmental, ecological or aboriginal assessment. As a result this report should be read in conjunction with the Statement of Environmental Effects (SEE) and any supporting assessments and reports submitted in support of the DA, which shall address the environmental, ecological or Aboriginal features known to the applicant/client for consideration during the Development Application (DA) process.

It is the responsibility of the applicant/client to disclose the details of any threatened species, population or ecological community identified under the Threatened Species Conservation Act 1995 that is known to the applicant to exist on the property and details and location of any Aboriginal object (within the meaning of the National Parks and Wildlife Act 1974) or Aboriginal place (within the meaning of that Act) that is known to the applicant to be situated on the property.

Identification of any significant environmental features may include the following:

- Riparian corridors
- SEPP 14 – Coastal Wetlands
- SEPP 26 Littoral Rainforest
- SEPP 44 – Koala Habitat
- Areas of geological interest
- Environmental protection zone or steep lands (>18°)
- Land slip or flood prone areas
- National parks estate or various other reserves

Details of threatened species, populations, endangered ecological communities and critical habitat known to the applicant may include the following:

- Details of some threatened species can be found online (www.environment.nsw.gov.au)
- Past studies or surveys for the area (e.g. local environment studies)
- Documentation supplied to council in relation to flora and fauna

Details of Aboriginal heritage known to the applicant

- Past surveys and information held by the DEC (application fees may apply).

1.4 Aim & Objectives

1.4.1 Aim and Objectives of PBP 2019

All development on BFPL must satisfy the aim and objectives of Planning for Bush Fire Protection (PBP 2019). This report demonstrates how the requirements can be met by ensuring suitable Bushfire Protection Measures (BPM) are put in place commensurate with the level of risk and characteristics of the occupants.

The aim of PBP is to provide for the protection of human life and minimise impacts on property from the threat of bush fire, while having due regard to development potential, site characteristics and protection of the environment.

The objectives are to:

- Afford buildings and their occupants protection from exposure to a bush fire.
- Provide for a defensible space to be located around buildings.
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.
- Ensure that appropriate operational access and egress for emergency service personnel and occupants is available.
- Provide for ongoing management and maintenance of BPMs; and
- Ensure that utility services are adequate to meet the needs of firefighters.

1.4.2 Specific Objectives – Subdivisions (s.5 PBP)

- Minimise perimeters of the subdivision exposed to the bushfire hazard (hourglass shapes, which maximise perimeters and create bottlenecks should be avoided).
- Minimise vegetation corridors that permit the passage of bushfire towards buildings.
- Provide for the siting of future dwellings away from ridge-tops and steep slopes, within saddles and narrow ridge crests.
- Ensure that APZs between a bushfire hazard and future dwellings are effectively designed to address the relevant bushfire attack mechanisms.
- Ensure the ongoing maintenance of APZs.
- Provide adequate access from all properties to the wider road network for residents and emergency services.
- Provide access to hazard vegetation to facilitate bushfire mitigation works and fire suppression.
- Ensure the provision of an adequate supply of water and other services to facilitate effective firefighting.

2 BUSHFIRE RISK ASSESSMENT

This Bushfire Risk Assessment includes an analysis of the hazard, threat and subsequent risk to the development as proposed and provides recommendations that the proposal satisfies the aim and objectives of PBP 2019 by complying with the acceptable solutions or performance criteria by applying an appropriate suite of bushfire protection measures (BPM) for the development as proposed, commensurate with the level of risk and characteristics of the occupants.

The bushfire risk assessment shall incorporate provisions to ensure appropriate separation distance between building/s and the hazard can be afforded relevant to the BAL rating. The specific objectives for the proposed development shall be met by demonstrating compliance against the acceptable solutions set out in PBP. Alternatively, deviations from the acceptable solutions will be addressed by providing performance solutions to demonstrate compliance.

2.1 Methodology

2.1.1 PBP 2019

The bushfire risk assessment was undertaken pursuant to the requirements set out in s.5 – *Residential and Rural Residential Subdivisions* (PBP 2019).

2.1.2 Site Analysis

A desktop and onsite assessment were carried out pursuant to the methodology described in PBP 2019 commensurate with the proposed development type and level of risk. The following methodology was used:

As per the acceptable solutions, the minimum distance for APZs was determined pursuant to Table A1.12.3 Appendix 1 PBP.

The acceptable solution as per the methodology described in Appendix 1 – Site Assessment Methodology using table A1.12.6 – Determination of BAL, FFDI 80 – residential development (PBP 2019) was used to determine the BAL rating and appropriate APZ/setbacks for the proposed development.

2.1.3 Vegetation & Significant Environmental Features

The assessment and classification of the predominant vegetation types on and surrounding the subject site (out to a minimum distance of 140m from the boundaries of the property) was undertaken, using Keith (2006) vegetation classification system as described in PBP (2019).

2.1.4 Slope & Aspect

An assessment of the aspect and effective slope, being the land under the classified vegetation most likely to have the greatest effect on bushfire behaviour within 100m of the site was undertaken.

Slope analysis was undertaken using assessment methodology:

- A desktop assessment of 2, 5 or 10m contours available via the Fire Protection Association (FPAA) *FireMaps NSW* platform (FPAA 2022)

- On-site ground truthing was undertaken on-site, the slope was determined using a Leopold Laser Range Finder and a comparison made to determine the effective slope of the hazard. The results presented in the assessment tables herein.

2.1.5 Bushfire Protection Measures (BPM)

The BPMs are a set of measures to be satisfied which aim to reduce risk from bushfires and enhance occupant survival, property protection and community resilience to bushfire attack. Analysis of the BPMs shall be undertaken commensurate to the level of risk to occupants and the subject site. Recommendations provided are based on the results. BPMs to be satisfied include the following:

- APZ
- Access
- Construction
- Siting and design
- Landscaping
- Services
- Emergency and evacuation planning





3 ANALYSIS & RESULTS

The following sections describe in detail, the vegetation type, slope, access, availability of water supplies and environmental considerations for the subject site and surrounds as presented in the following figures and tables.

3.1 Site Inspection Details

An assessment of the subject site was undertaken by Melanie Jackson (BPAD-Level 3 Accredited Practitioner No. 21977) on 4 February 2023.

Table 2: Vegetation Analysis

Vegetation Classification, Direction, Plot, Description & Photos	
<p>Northwest, North & Northeast – Grassland</p> <p>Directly north of the subject site on the opposite side of Pullen Street are two fenced properties with dwellings managed in a low fuel state.</p> <p>Encapsulating these properties is a large rural lot considered grassland, being a lower bushfire threat to the subject site traversing gently sloping land.</p>	
<p>Northwest – Forest</p> <p>Forest vegetation traverses the road reserve down to the lower slopes of the property to the north, also traversing along a creek.</p>	
<p>West – Forest</p> <p>The forest west consists of a narrow tract of vegetation starting beyond Ryan Crescent west. The forest widens out along the creek to a large dam. The forest to the northwest and west are dissected by Woolgoolga Creek Road, which traverses in an east west direction.</p>	
 <p>Photo 1: North (left) along Pullen Street</p>	 <p>Photo 2: North grassland</p>
 <p>Photo 3: Northwest forest</p>	 <p>Photo 4: Managed land south of the subject site</p>



Legend

Slope profiles	Property boundary	140m survey	100m survey	VEG	Lot Boundary	Hydrography - lines
◄ Slope survey	Proposed sub-division boundary	Veg survey buffer	Slope survey buffer	Forest	—	Contours (2m)
	Subject Site			Grassland	— Roads	

Map Printed from FireMaps on Mon Apr 03 10:56:01 AEST 2023

Figure 3: Vegetation analysis (Source: FireMaps 2023; Nearmap 2023)

3.2 Bushfire Protection Measures (BPM)

The BPMs, namely APZ, access, construction, siting and design, landscaping, services and emergency and evacuation planning, are the relevant set of specifications and requirements to be satisfied to improve life safety, property protection and community resilience to bushfire attack.

3.2.1 APZ & Landscaping

APZ shall comply with the acceptable solutions, assessed using table A1.12.3 – *Minimum distances for APZs – Residential development FFDI 80 areas (<29kW/m², 1090K)* as per the setbacks presented in Table 3 herein, which relate to the separation distance between the BE and the hazard.

- The APZ is to be managed within the bounds of the subject site in perpetuity pursuant to Appendix 4 – Asset Protection Zone Requirements (PBP).
- Landscaping shall comply with the acceptable solutions & NSW RFS 'Asset Protection Zone Standards' shall be met.

3.2.2 Likely Environmental Impacts

The scope of this report does not include an environmental assessment of the mature and regrowth vegetation required to be removed for bushfire management purposes and therefore this report should be read in conjunction with the Statement of Environmental Effects (SEE) and the supporting ecological assessment report submitted in support of the subdivision application.

However the following ecological matters were considered in the preparation of the bushfire assessment report:

- All lots require ongoing management of the APZ in perpetuity as an Inner Protection Area (IPA).
- There is a large tree and shrub which may require modification to ensure a suitable BE is made available and the lot can be managed as an IPA in perpetuity.
- The existing dwelling has a suitable APZ managed as an IPA and does not appear to require vegetation modification for the development to proceed.
- It is the responsibility of the owner/applicant to ensure appropriate approval is sought for any vegetation modification and/or removal.

3.2.3 Access

Property access is off Crabbe Street, south of the subject site complying with the acceptable solutions via a short driveway to both the existing dwelling (Photo 5) and a new short driveway proposed to service lot 2.

The access will be situated no more than 70m between the most distant part of the proposed BE and the hydrant which is located opposite the existing or proposed dwelling site (Photo 5; Photo 6; Figure 4).



Photo 5: Existing driveway (Lot 1)



Photo 6: Council managed road (West Street)

3.2.4 Water Supplies for Fire Fighting Purposes

Reticulated water supplies service the area. Compliance with the acceptable solutions shall be met. The existing water supply that currently services the existing development shall be deemed acceptable as it forms part of Councils existing infrastructure, it is therefore assumed it functions as per it's intended use. For this reason, the hydrant system has not been tested.

The proposed development being an additional single lot, is unlikely to place pressure on the existing reticulated water supply system. An additional supply for firefighting purposes is not required (Ref. Photo 7).



Photo 7: Hydrant on Crabbe Street, opposite the subject site

3.2.5 Electricity & Gas Services

Existing aboveground electricity services the locality. Compliance with the acceptable solutions shall be achieved for the proposed lot.

3.3 Summary of Results – APZ & BAL Rating

A summary of the findings of the on-site bushfire risk assessment is presented in the following table/s of results (Ref. Figure 4).

Table 3: APZ & BAL Analysis & Results Summary

Vegetation Hazard Analysis			Acceptable Solution	APZ & BAL Results (Recommended)	
Direction	Vegetation Class / Formation	Veg Slope (°)	Complies with Table A1.12.3	APZ (m)	Highest BAL rating
North, East & South	Managed land	-	YES	Entire lot	-
North & Northeast	Grassland	0-5 down	YES	Entire lot	19 [^]
Northwest 1.	Forest	5-10 down	YES	Entire lot	12.5
Northwest 2.	Grassland	5-10 down	YES	Entire lot	12.5
West	Forest	5-10 down	YES	Entire lot	29*
* Proposed Lot 1 – the highest BAL (BAL-29) is in the northwest corner.					
[^] Proposed Lot 2 – the highest BAL (BAL-19) is in the northeast corner.					



Legend

Slope profiles

◄ Slope survey

Property boundary

Proposed sub-division boundary

Subject Site

140m survey

Veg survey buffer

100m survey

Slope survey buffer

Buildings

Proposed Driveway

Existing BE

Hydrant

Proposed Building Envelope

VEG

Forest

Grassland

BAL

BAL-12.5

BAL-19

BAL-29

Lot Boundary

Hydrography - lines

Contours (2m)

Hydrography - areas

Perennial

Non-perennial

Mainly dry

Map Printed from FireMaps on Mon Apr 03 10:44:59 AEST 2023

Figure 4: Site analysis & BAL results (Source: FireMaps 2023; Nearmap 2023)

4 RECOMMENDATIONS & COMPLIANCE

The following table/s indicate the extent to which the proposed development conforms with or deviates from the standards, specific objectives, performance criteria and acceptable solutions set out in s.5 – *Residential and Rural Residential Subdivisions* (PBP).

The results and recommendations herein are commensurate with the level of bushfire risk and characteristics of the occupants for the proposed development, by applying the suite of BPM in combination, being the site-specific requirements that must be satisfied in order to comply. The table below specifies the method used to demonstrate compliance i.e. acceptable solution or performance-based solution, against the BPMs and provides recommendations to ensure the intent of each BPM shall be met (Ref. Table 4).

NB: the following indicate level of compliance:

- **Acceptable Solution** – complies with the Acceptable Solution/s; some works may be required to meet the requirements.
- **Performance Solution** – complies with the Performance Solutions.
- **Assumed (previous approval/s)** – it is assumed this requirement has been met under existing approval/s i.e. existing infrastructure/DA approval/s.
- **N/A** – not applicable; this solution is not relevant to this proposal.

Table 4: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
The intent may be achieved where:			
s.5.3.1 APZ – Intent of measures: To provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact.			
APZ	<ul style="list-style-type: none"> Potential building footprints must not be exposed to radiant heat levels exceeding 29kW/m² on each proposed lot. 	<ul style="list-style-type: none"> APZs are provided in accordance with Tables A1.12.2 or A1.12.3 based on the FFDI. 	Acceptable Solution <ul style="list-style-type: none"> The APZ can comply with the minimum recommended distances pursuant to table A1.12.3 (PBP) commensurate with BAL-29 construction level. A defensible space will be provided as a result of the recommended APZ results presented in Table 3 herein.
APZ	<ul style="list-style-type: none"> APZs are managed and maintained to prevent the spread of a fire towards a building. 	<ul style="list-style-type: none"> APZs are managed in accordance with the requirements of Appendix 4 (PBP). 	Comply with the Acceptable Solution The APZ shall be: <ul style="list-style-type: none"> Managed in perpetuity as an IPA. Ensure retained trees are pruned min. 2m back from the buildings (proposed and existing). Management of the APZ shall be undertaken in perpetuity as per the requirements of Appendix 4 PBP for the distances set out herein (summarised above).
APZ	<ul style="list-style-type: none"> The APZ is provided in perpetuity. 	<ul style="list-style-type: none"> APZs are wholly within the boundaries of the development site. 	Acceptable Solution
APZ	<ul style="list-style-type: none"> APZ maintenance is practical, soil stability is not compromised and 	<ul style="list-style-type: none"> APZ are located on lands with a slope less than 18 degrees. 	Acceptable Solution

Table 4: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
	the potential for crown fires is minimised.		
Landscaping	<ul style="list-style-type: none"> Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions. 	<ul style="list-style-type: none"> Landscaping is in accordance with Appendix 4 (PBP); & Fencing is constructed in accordance with section 7.6. 	<p>Comply with the Acceptable Solution</p> <ul style="list-style-type: none"> Landscaping is to be managed in accordance with Appendix 4 (PBP) and where required fences shall be constructed as follows: All fences in bush fire prone areas should be made of either hardwood or non-combustible material. In circumstances where the fence is within 6m of a building or in areas of BAL-29 or greater, they should be made of non-combustible material only.
<p>s.5.3.2 Access – Intent of measures: To provide safe operational access to structures and water supply for emergency services, while residents are seeking to evacuate from an area.</p>			
Access (General Requirements)	<ul style="list-style-type: none"> The capacity of access roads is adequate for firefighting vehicles. 	<ul style="list-style-type: none"> The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges and causeways are to clearly indicate load rating. 	<p>Acceptable Solution</p> <ul style="list-style-type: none"> The existing public roads system appear adequate. There is no requirement to upgrade and/or modify the existing public road system.
Access (General Requirements)	<ul style="list-style-type: none"> There is appropriate access to water supply. 	<ul style="list-style-type: none"> Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression. Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2005 – <i>Fire hydrant</i> 	<p>Assumed (previous approval/s)</p> <ul style="list-style-type: none"> There is no requirement to upgrade and/or modify the existing hydrant system.

Table 4: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<p><i>installations System design, installation and commissioning; and</i></p> <ul style="list-style-type: none"> There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available. 	
Property Access	<ul style="list-style-type: none"> Firefighting vehicles can access the dwelling and exit the property safely. 	<ul style="list-style-type: none"> There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles. <p>In circumstances where this cannot occur, the following requirements apply:</p> <ul style="list-style-type: none"> Minimum 4m carriageway width. In forest, woodland and heath situations, rural property roads have passing bays every 200m that are 20m long by 2m wide, making a minimum trafficable width of 6m, at the passing bay. A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches. Provide a suitable turning area in accordance with Appendix 3. 	<p>Comply with the Acceptable Solution</p> <ul style="list-style-type: none"> A short driveway shall suffice to both the proposed and existing lot. Ensure the most distant part of the proposed BE on Lot 2 is sited no more than 70m via an unobstructed pathway from the existing hydrant.

Table 4: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<ul style="list-style-type: none"> Curves have a minimum inner radius of 6m and are minimal in number to allow for rapid access and egress. The minimum distance between inner and outer curves is 6m. The crossfall is not more than 10 degrees. Maximum grades for sealed roads do not exceed 15 degrees and not more than 10 degrees for unsealed roads; and A development comprising more than three dwellings has formalised access by dedication of a road and not by right of way. <p>Note: Some short constrictions in the access may be accepted where they are not less than 3.5m wide, extend for no more than 30m and where the obstruction cannot be reasonably avoided or removed. The gradients applicable to public roads also apply to community style development property access roads in addition to the above.</p>	
s.5.3.3 Services – Water, Electricity and Gas – Intent of Measures: To provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building.			
Water Supplies	<ul style="list-style-type: none"> Adequate water supplies are provided for firefighting purposes. 	<ul style="list-style-type: none"> Reticulated water is to be provided to the development where available. A static water and hydrant supply are provided for non-reticulated developments or where 	Acceptable Solution <ul style="list-style-type: none"> An existing reticulated water supply services the lot. There is no requirement to upgrade the existing hydrant system.

Table 4: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
		<p>reticulated water supply cannot be guaranteed. &</p> <ul style="list-style-type: none"> Static water supplies shall comply with Table 5.3d. 	
Water Supplies	<ul style="list-style-type: none"> Water supplies are located at regular intervals; and The water supply is accessible and reliable for firefighting operations. 	<ul style="list-style-type: none"> Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2005. Hydrants are not located within any road carriageway; and Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads. 	<p>Assumed (previous approval/s)</p> <ul style="list-style-type: none"> The existing hydrant system which services the existing lot appears satisfactory. There is no requirement to upgrade the existing water supply.
Water Supplies	<ul style="list-style-type: none"> Flows and pressure are appropriate. 	<ul style="list-style-type: none"> Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2005. 	<p>Assumed (previous approval/s)</p> <ul style="list-style-type: none"> The existing hydrant system has not been tested; as Councils existing infrastructure it is assumed the system, which services the existing housing estate is deemed satisfactory. The existing hydrant system appears adequate to service the additional lot. There is no requirement to upgrade the existing water supply system.
Water Supplies	<ul style="list-style-type: none"> The integrity of the water supply is maintained. 	<ul style="list-style-type: none"> All above-ground water service pipes are metal, including and up to any taps. & Above-ground water storage tanks shall be of concrete or metal. 	<p>Comply with the Acceptable Solution</p>

Table 4: Compliance Tables; Re: s.5 – Residential and Rural Residential Subdivisions (PBP)

BPM	Performance Criteria	Acceptable Solutions	Compliance & Recommendations
Electricity Services	Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	<ul style="list-style-type: none"> Where practicable, electrical transmission lines are underground; and Where overhead, electrical transmission lines are proposed as follows: <ul style="list-style-type: none"> Lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and No part of a tree is closer to a power line than the distance set out in <i>ISSC3 Guideline for Managing Vegetation Near Power Lines</i>. 	Comply with the Acceptable Solution <ul style="list-style-type: none"> The existing electricity supplies appear satisfactory. All upgrades and new electricity supply services and installation shall be undertaken in accordance with the acceptable solutions.
Gas Services	Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	<ul style="list-style-type: none"> Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - <i>The storage and handling of LP Gas</i>, the requirements of relevant authorities, and metal piping is used. All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side. Connections to and from gas cylinders are metal. Polymer-sheathed flexible gas supply lines are not used; and Above-ground gas service pipes are metal, including and up to any outlets. 	Comply with the Acceptable Solution Comply with the acceptable solutions where installed.

5 CONCLUSION

The combination of BPM's and recommendations contained within this document, aim to reduce the impacts of a bushfire attack to the occupants, firefighters, building/s and environment. With the aim to reduce consequences of ember attack and direct flame contact with building/s able to be constructed within the proposed BE. Acceptable and performance solutions (where applicable) in relation the bushfire protection measures in combination were used to demonstrate compliance against the performance criteria of PBP.

This report makes the determination through a detailed Bushfire Risk Assessment that the proposed development does not appear to negatively affect the indicative BE, situated in an area where radiant heat levels are unlikely to exceed critical limits (29kW/m^2). The results of which are based on the proviso the recommended APZ distances and ongoing maintenance in perpetuity is undertaken.

As a qualified consultant in Bushfire Risk Assessment as recognised by the NSW Rural Fire Service, this report has considered all elements of bushfire attack and BPMs in combination. Provided the development proposal is carried out in accordance with the recommendations contained herein, the development, in my professional opinion, shall satisfy the objectives and performance criteria of PBP (2019).

The proposed development requires a BFSa from the NSW RFS under s.100B of the RF Act. This report concludes the proposed development complies with the requirements of PBP (2019) for integrated development.

It is concluded that this report has satisfactorily demonstrated that the existing dwelling on Lot 1 and the BE on proposed Lot 2 complies with the integrated development requirements of PBP (2019).

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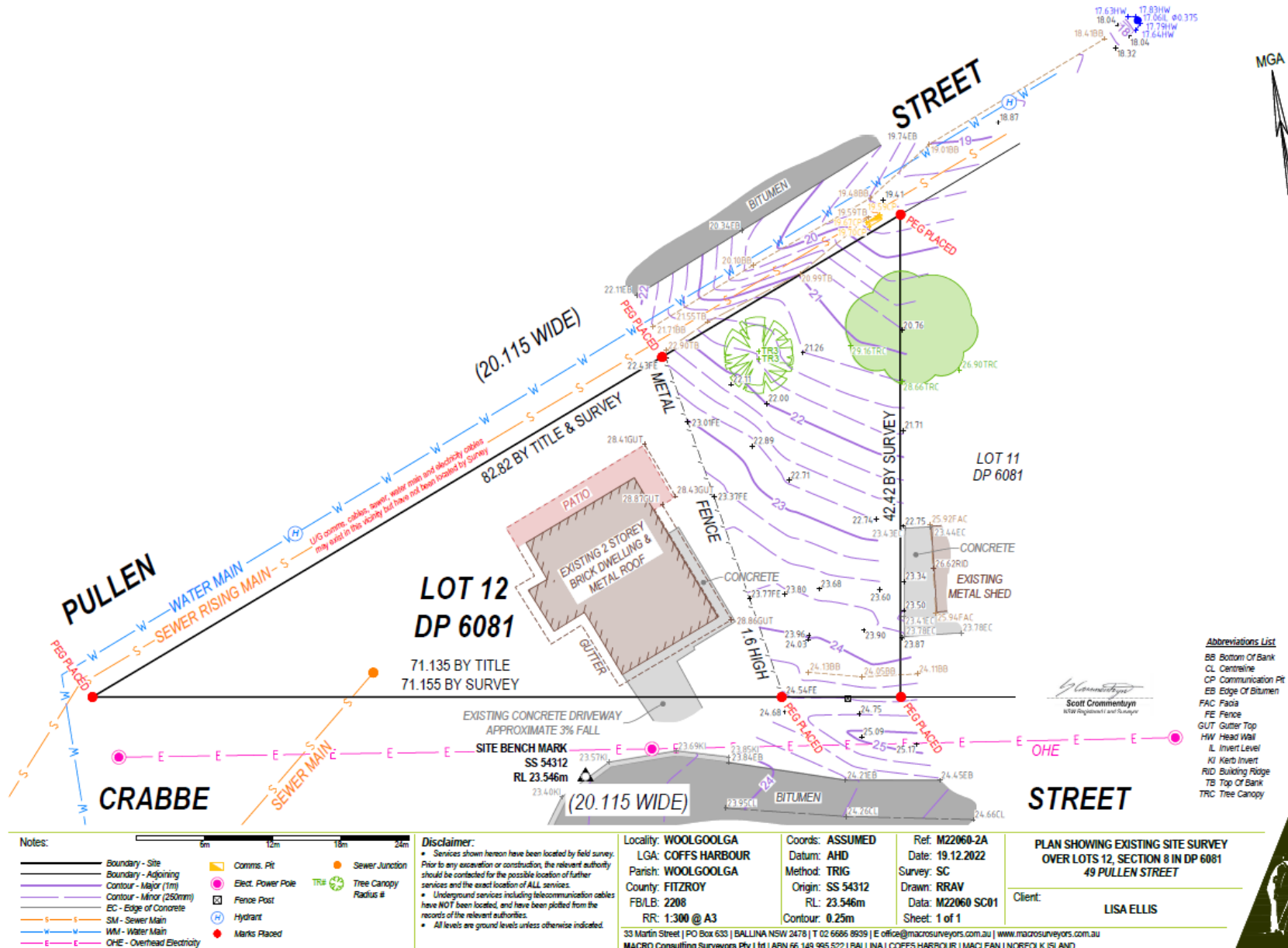
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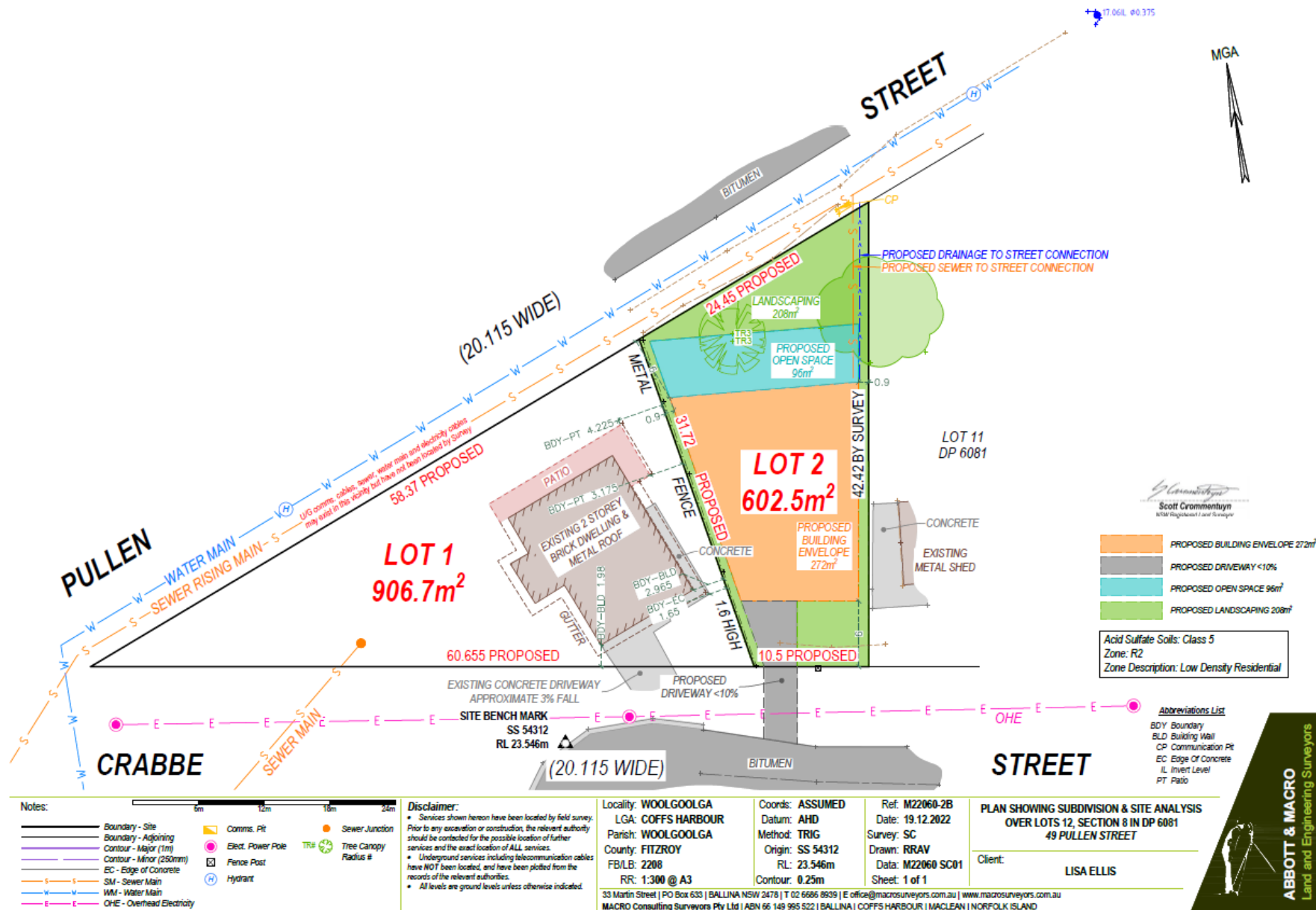
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APPENDIX A – SITE PLANS

Plans by: Plans by Abbott & Macro; 19/12/2022.

A full set of plans shall be provided by the applicant to accompany the DA. All design and site plans must ensure compliance with the minimum building setbacks in relation to this development as proposed and the recommendations contained herein.







APPENDIX B – RFS GUIDELINES & FAST FACTS

APPENDIX 4

ASSET PROTECTION ZONE REQUIREMENTS

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

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

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

A4.1 Asset Protection Zones

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

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

An APZ provides:

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

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

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

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

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

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

A4.1.1 Inner Protection Areas (IPAs)

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

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

When establishing and maintaining an IPA the following requirements apply:

Trees

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

Shrubs

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

Grass

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

A4.1.2 Outer Protection Areas (OPAs)

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

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

When establishing and maintaining an OPA the following requirements apply:

Trees

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

Shrubs

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

Grass

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

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



Figure A4.1

Typical Inner and Outer Protection Areas.

