



Bushfire Assessment and Development Report

Merrimu PSP

April 2021



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Revision	Date	Details
A	10 April 2019	Draft
B	3 May 2019	Draft for submission to client
C	28 May 2019	Update
D	11 July 2019	Final
E	25 April 2020	Updated in response to VPA and client comments
F	12 May 2020	Final for client
G	27 May 2020	Updated with client comments
H	November 2020	Updated in response to VPA and client comments
I	April	Updated in response to VPA comments

1.0 INTRODUCTION

1.1 Scope of Study

This Bushfire Assessment and Development Report has been prepared by Southern Cross Town Planning Pty Ltd in response to the requirements of the Moorabool Planning Scheme. Southern Cross Town Planning is a Corporate member of the Fire Protection Association of Australia.

Southern Cross Town Planning Pty Ltd was commissioned by Ethos Urban, on behalf of Bacchus Marsh Developments (BMD) to assess the Merrimu Precinct from a bushfire perspective, and to consider how the future development of the precinct can be designed to mitigate and respond to the potential impact of bushfire.

The Merrimu Precinct is located to the north of the Western Freeway and Bacchus Marsh township, and is part of the Bacchus Marsh District Urban Growth Framework . The Growth Framework seeks to direct future growth in Bacchus Marsh. This Bushfire Assessment and Development Report applies to the entire Merrimu Precinct.

Bacchus Marsh is a fringe area of Melbourne. Plan Melbourne and the Central Highlands Regional Growth Plan refer to Bacchus Marsh as a regional centre in recognition of its historical service centre role. The Plans notes that Bacchus Marsh has the potential to play a role in relieving population pressure on metropolitan Melbourne by absorbing a share of the projected housing growth.

This report responds to the planning framework for bushfire management, as identified in the Planning Policy and Local Planning Policy Frameworks and relevant provisions of the Moorabool Planning Scheme and Planning Practice Note 64.

It is also noted that the Precinct was included as part of the Bacchus Marsh District Urban Growth Framework, which formed part of Moorabool Amendment C81. In considering the amendment, the Panel for C81 noted the following;

In relation to Bushfire Planning, the Amendment strengthens the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life. It does this by identifying (in Clause 21.07-8) the need for a detailed assessment of bushfire risk, in accordance with Clause 13.05, prior to the preparation of PSPs or development plans.

This report reflects this direction.

1.2 Background

Amendment VC 140 came into force on 12 December 2017. The *Bushfire State Planning Policy Amendment VC140* (Planning Advisory Note 68), was published in March 2018.

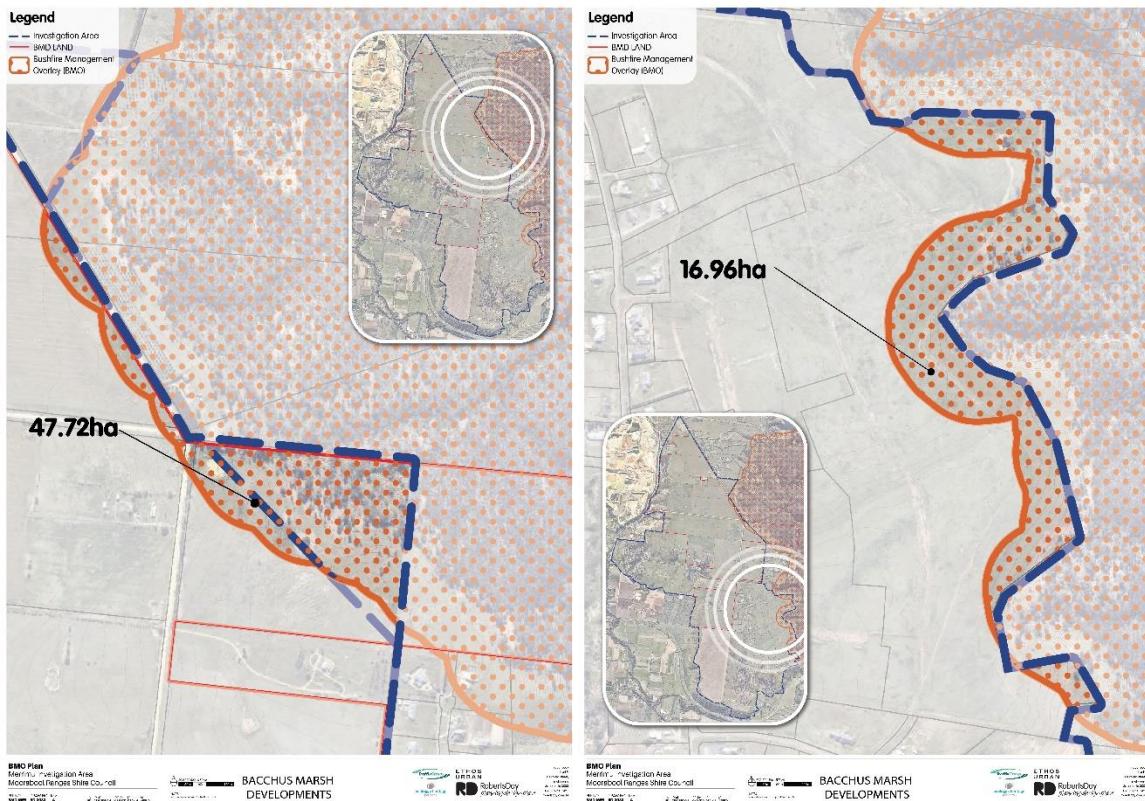
In accordance with the Advisory Note prepared with the Amendment, regional growth plans, precinct structure plans, planning scheme amendments and planning permit applications must assess bushfire hazards and include appropriate bushfire protection measures as mandated in the updated State Planning Policy Clause 13.02 - Bushfire. Clause 13.02 applies to;

'....all planning and decision making under the Planning and Environment Act 1987 relating to land which is:

- *Within a designated bushfire prone area;*
- *Subject to a Bushfire Management Overlay; or*

- *Proposed to be used or developed in a way that may create a bushfire hazard’.*

As the Merrimu Precinct is within a Designated Bushfire Prone Area (and a small area to the west of Bences Road included in the Bushfire Management Overlay), appropriate bushfire protection measures are required.



Map 1 – Extent of BMO within PSP

As noted, Moorabool Amendment C81 sought to direct growth in Bacchus Marsh. Planning Panel considered C81 in August 2018. Concerning the issues of bushfire, the Panel noted as follows;

The Panel generally supports the Amendment with respect to the Merrimu growth precinct and acknowledges that the extensive revisions proposed by Council prior to and during the Hearing process has significantly improved the content of the UGF and the LPPF. These changes have clarified and enhanced the proposed provisions without transforming the Amendment and have been made in direct response to submissions. The modifications made in response to submissions from Long Forest Estate, the Watsons, Waltons and Mr Reid are examples of the improvements to the Amendment as a result of the Hearing process.

The key issue for the Merrimu precinct (other than the issues dealt with elsewhere in separate chapters in this report) is whether the land within the BMO should be included within the Merrimu growth precinct.

The Panel considers it is appropriate to exclude the two areas currently within a BMO on the eastern side of Merrimu based on a variety of factors, including:

- the topography of the sites
- the extensive vegetation on the sites
- the potential for the sites to include habitat for threatened flora and fauna
- the bushfire risk, including that the land is affected by a BMO
- the advice of a bushfire risk assessment expert
- the recommendations of the CFA
- the requirements of Clause 13.05, including the recent Amendment VC140.

On balance, the Panel believes it is prudent at this stage to exclude this land from the growth precinct. In accordance with Clause 10.01, the Panel prioritises the protection of human life over all other policy considerations.

If evidence can be provided in the future that demonstrates the land within the BMO (or some significant portion of it) can be developed, then a modification to the eastern boundary of the precinct could be considered at that time. The Panel notes that the Urban Growth Framework Plan (Plan 1) states the boundary of all Strategic Outcome Areas (including Merrimu) are “subject to confirmation”. Alternatively, a separate planning scheme amendment could be pursued to facilitate that outcome. At present, the Panel does not believe there is sufficient evidence to include the land within the BMO in the growth precinct.

The Panel does not accept the view of BMD that the exhibited version of Plan 1 in the UGF in relation to the eastern portion of the Merrimu precinct should prevail. It is clear to the Panel that this area is subject to significant constraints and the Panel supports the approach preferred by Council in its closing submission.

The Panel also agrees with the final position of Council that there is no need for an additional 100 metre buffer outside the BMO area. As the CFA and Mr O’Keeffe pointed out, the BMO already includes a 150 metre buffer and this is adequate.

Further planning to mitigate bushfire risk to an acceptable level is therefore required as part of the ongoing structure planning process.

2.0 METHODOLOGY

The methodology adopted in preparing this report involved a response to Planning Policy Framework Clause 13.02 of the Moorabool Planning Scheme and the requirements of Planning Practice Note 64.

2.1 Planning Policy Framework

The Strategies of the Framework seek to deliver the objective of strengthening the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life. Specifically, these Strategies are:

- *Protection of human life*
- *Bushfire hazard identification and assessment*
- *Settlement planning*
- *Areas of high biodiversity conservation value, and*
- *Use and development control in a Bushfire Prone Area*

2.2 Planning Practice Note 64

Planning Practice Note 64 establishes a structured approach to risk management to provide decision makers with information to determine whether the bushfire risk has been reduced to an acceptable level.

The purpose of the Practice Note is to:

- *provide guidance about local planning for bushfire protection*
- *assist councils to tailor the Local Planning Policy Framework in response to bushfire matters where necessary*
- *provide guidance on how to prepare schedules to the Bushfire Management Overlay.*

The four stages/steps of this process recommended by Planning Practice Note 64 are;

Four-step approach to considering bushfire

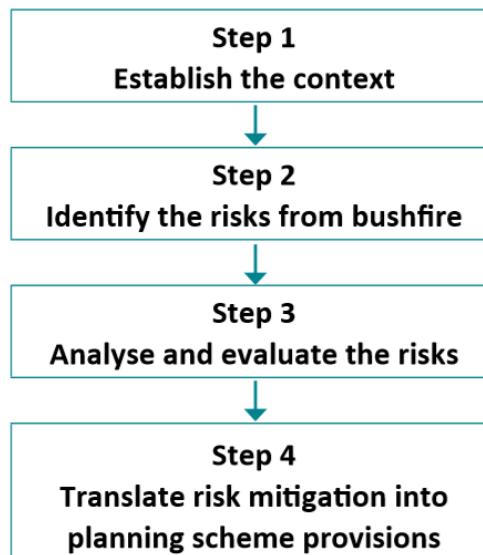


Table 1 – Four stage approach

The following chapter (Chapter 3) of this report establishes the context of the Precinct including a description of the study area and its surrounds, local and state-wide planning controls, Framework Plans, the Moorabool Municipal Emergency Management Plan and other relevant legislation. It also establishes the broader bushfire context for the region.

Chapter 4 details the Precinct's risk from bushfire. This includes the characteristics of the bushfire hazard including the type, area and location of vegetation; the topography of the land and its potential impact on the intensity and severity of bushfire; and the likely bushfire behaviour at both the local and broader scale. It also includes a risk assessment of the forms of bushfire attack to be expected (direct flame contact, radiant heat, embers).

Chapter 5 analyses and evaluates the bushfire risk.

Chapter 6 seeks to provide guidance on the preparation of design and planning scheme outcomes to mitigate the bushfire risk.

3.0 ESTABLISH THE CONTEXT

3.1 Merrimu Precinct

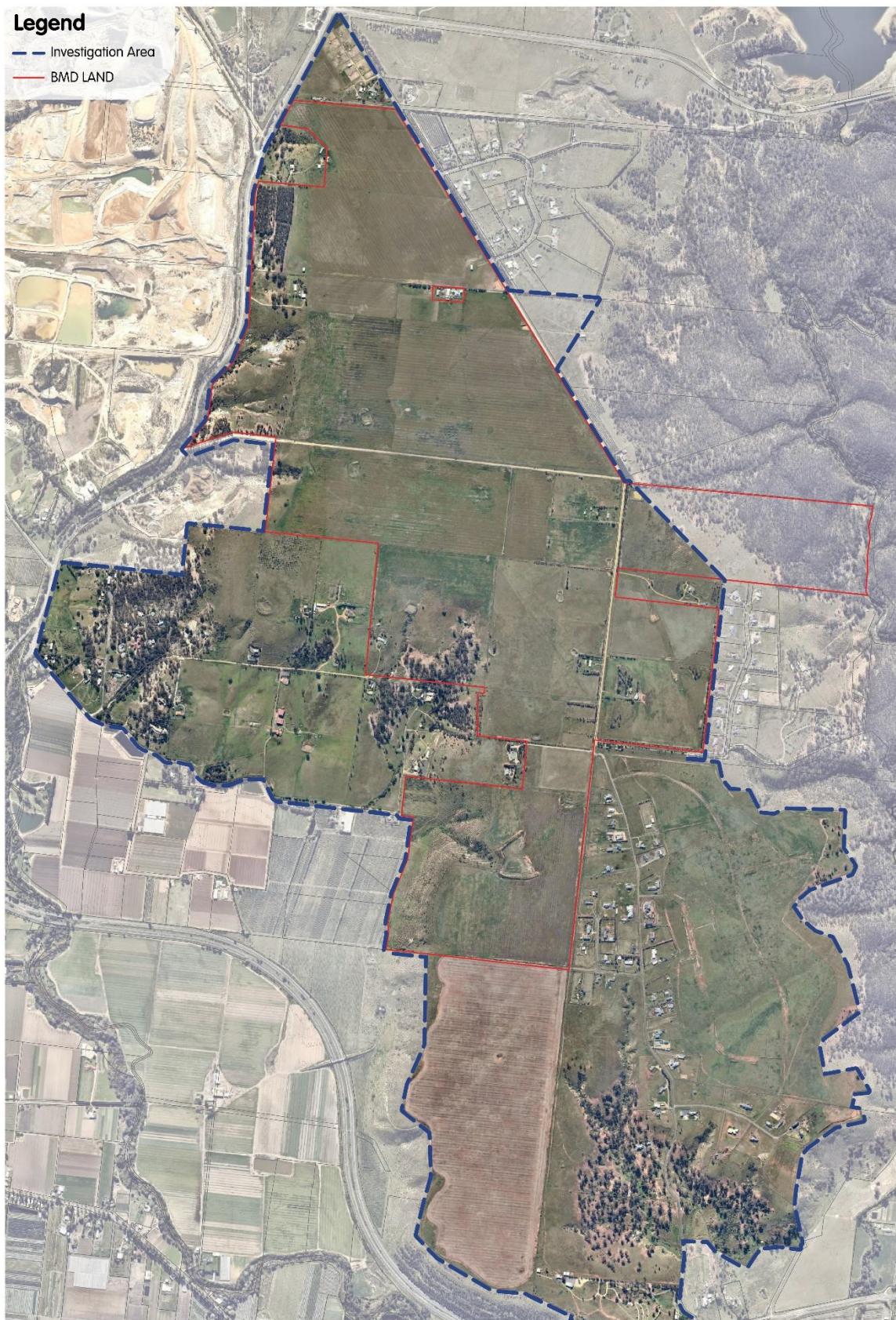
The Merrimu Precinct forms part of the Bacchus Marsh District Urban Growth Framework. The Merrimu Precinct extends northwards from the Western Freeway, including the rural fringe areas of Merrimu, Coimadai (part), Long Forest (part) and Rowsley (part). It contains a mixture of vegetation types, landforms and land uses. It is shown on Map 2 below, together with a draft urban structure.

The land is included in the Farming Zone (FZ) and Rural Conservation Zone. Areas adjacent to the PSP area zoned Special Use Zone - Schedule 2 (SUZ2) and Public Conservation and Recreation Zone (PCRZ).

The Precinct is bordered by the Long Forest Nature Conservation Reserve and rural residential style development to the east, the Western Freeway and intensive agricultural areas to the south, rural residential style development and an active quarry to the west and grazing land to the north. The Precinct itself is currently used for agricultural and rural-residential uses.

A small section of land located to the west of Bences Road is affected by the Bushfire Management Overlay. The balance of the land within the Precinct is nominated as a Bushfire Prone Area under r.10 of the *Building Regulations 2006*, requiring minimum fire protection standards in construction.

There are various areas within the precinct boundary that due to existing conditions including topography, ecological value, existing development and cultural heritage value are not expected to undergo significant urban development. For the purpose of this assessment it is assumed that conditions within these areas unlikely to be developed will remain unchanged. Future development within these areas will be subject to appropriate bushfire assessment undertaken by the property owner/ developer.



Aerial Base Plan

Moorabool Ranges Shire Council

SCALE 1:10,000 SIZE A0
00000 00000

BACCHUS MARSH DEVELOPMENTS


ETHOS URBAN

RobertsDay
 planning design place

Map 2 – Merrimac PSP Area

3.2 Future Development Scenario

Proposed broad development plans indicate the Precinct will be developed with a mixture of conventional and medium density development within a traditional road network. Access to the precinct will generally utilise the existing road network.

Parts of the precinct defined as forested land or woodland will generally be set aside or will remain for conservation purposes (see Map 4). For the purpose of this assessment, is it assumed all forested land or woodland will be retained. Forested land is generally associated with slopes in a riverine environment on the eastern boundary of the Precinct. Other parts of the Precinct containing remnant woodland vegetation will also be set aside for conservation/open space purposes. The Precinct will also include community uses and retail areas. Areas have also been earmarked for conventional and medium density residential development. Emergency access perimeter roads are proposed to be located along all interfaces with vegetation.

Where areas of public open space are to be located along the western escarpment or boundaries of the Precinct, a formal publicly accessible perimeter roads network may not always be required where appropriate emergency vehicle access tracks are included within the public open space reserve. However, Emergency vehicle access tracks will be provided designed and constructed to the satisfaction of Council and the CFA. In these instances, management of the open space reserve in conjunction with the emergency vehicle access track will provide an appropriate asset protection and bushfire suppression as required by the Bacchus Marsh Urban Growth Framework.

3.3 Bacchus Marsh Strategic Land Use Direction

Bacchus Marsh is identified as a regional growth centre in Plan Melbourne as well as in the Central Highlands Regional Growth Plan. In order to respond to metropolitan growth pressures and to meet the strategic goals set out in these plans, Bacchus Marsh will need to provide for more than 20,000 additional residents by 2041. Some of this growth will be accommodated within the existing urban area, while the balance will be accommodated within the adjoining growth precincts of Merrimu, Hopetoun Park and Parwan Station (as inter-connected, master planned urban components of the wider Bacchus Marsh valley). Further land use planning is required within the Precinct before any development occurs.

3.4 Broader landscape bushfire context

The Lerderderg State Park to the north and north-west of the Precinct provides the broader, and primary landscape fire risk to the site. The extensive forests in this conservation reserve are located a minimum of 4km from the tapered northern edge of the Merrimu Precinct. The unmanaged forest (defined in accordance with AS3959-2018) extend for up to 25km to the north-west, and is located within complex topography. The Long Forest Nature Conservation Reserve to the east of the Precinct poses a more neighbourhood and localised bushfire threat.

Whilst these forested areas pose a landscape fire threat to both the Precinct and the broader Bacchus Marsh community, it is noted that the forest to the north is separated from the development precinct by cleared grazing land, public roads and an operating quarry.

3.5 Climate and Bushfire season

The climate in the Moorabool area is dominated by warm, dry summers and cool wet winters. In recent years there has been a significant decrease in average spring and autumn rainfalls. The bushfire season generally runs from December to April. Prevailing weather conditions associated with the bushfire season in the Moorabool Shire area are warm to hot north-westerly winds

accompanied by high temperatures and low relative humidity followed by a cool south-westerly change. Under the Victorian Government climate change projections, Moorabool Shire can expect to:

- be hotter with the greatest increases in temperature expected in summer;
- be drier with greatest decreases in rainfall expected in spring; and
- have fewer rainy days but increasing rainfall intensity.

3.6 Moorabool Bushfire History

The following table is extracted from the current Moorabool Municipal Emergency Management Plan. It details bushfire events over more recent years. It is noted that none of these bushfires have directly impacted the study area.

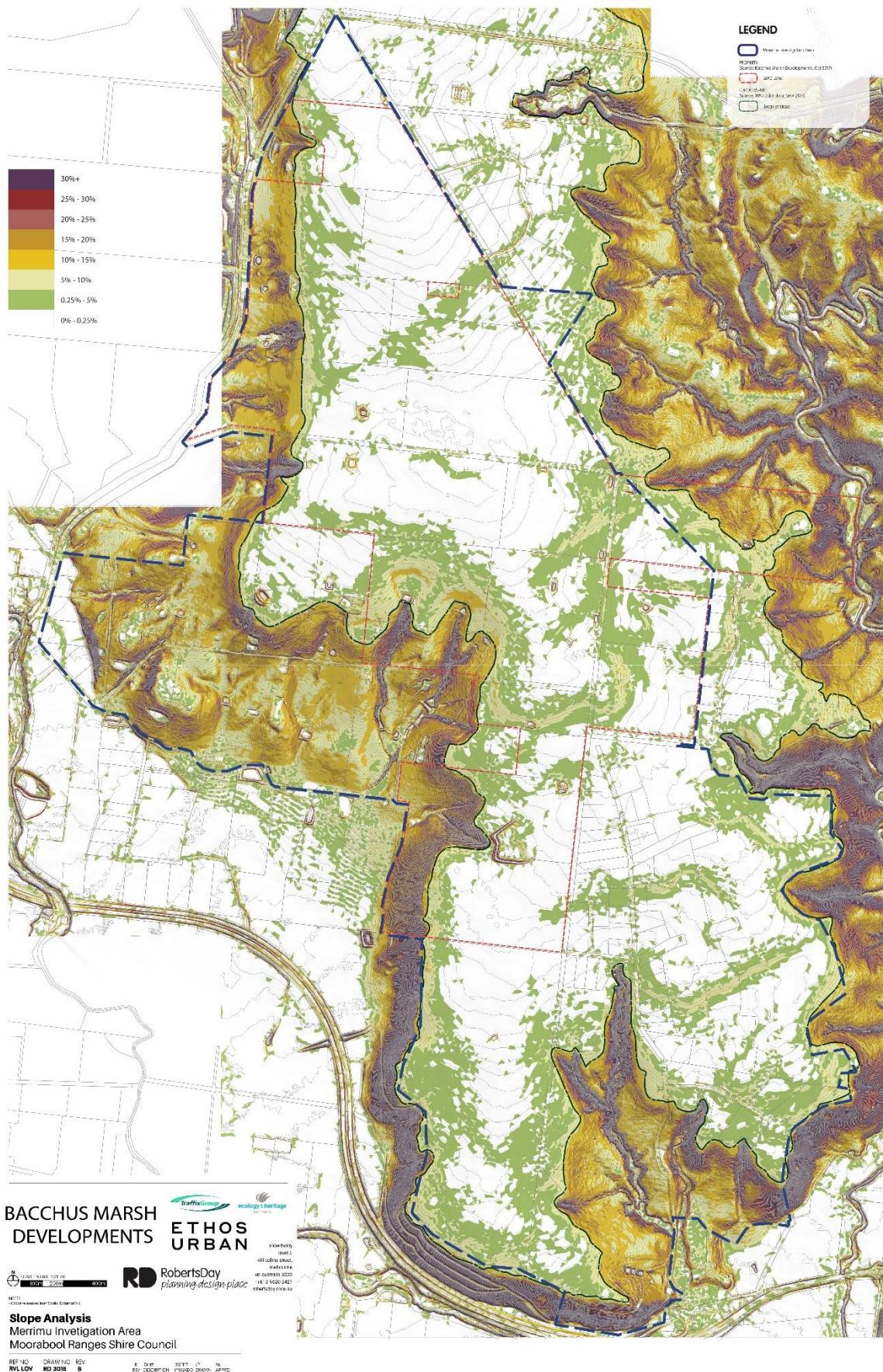
Fires	Dec 2015	Scotsburn Fires
	Feb 2013	Mt Warrenheip and Yendon
	Feb 2009	Muskvale Fire
	Jan 2008	Morrison's Fire
	Jan 2006	Anakie Fire
	Feb 1997	Creswick
	Jan 1983	Greendale

Table 2 – Moorabool Shire bushfire history

Source: Moorabool Municipal Emergency Management Plan 2017 - 2020

3.7 Topography

The Precinct lies within the Western Volcanic Plains region. The plains are deeply dissected by local, winding, permanent and intermittent watercourses with variable slopes and aspects. These watercourses include tributaries of the Lerderderg River and Pyrites Creek. The rugged valleys and ridges to the north associated with the Lerderderg State Park (part of the southern slopes of the Great Dividing Range) give way to more weathered hills and valleys to the south. Slopes generally fall to the south. A topographic map of the Precinct is included below at Map 3. Surrounding escarpments, particularly in the south, south-east and east, are a significant topographic feature within and abutting the Precinct.



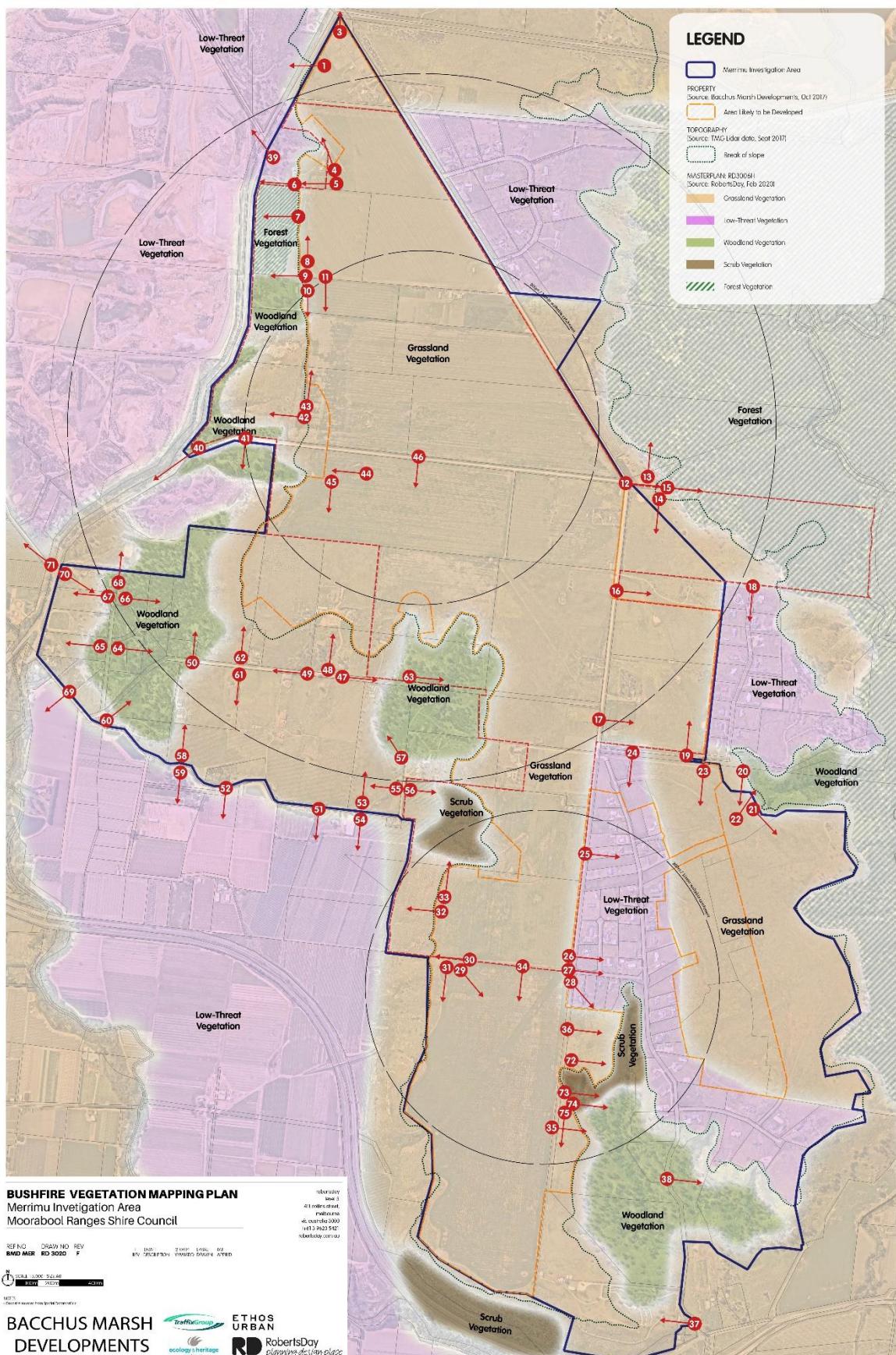
Map 3 - Topographic map of Merrimu Precinct

The proposed conventional and medium density development proposed will be confined to the flat and gently sloping central areas of the Precinct. Effective slopes under Classified Vegetation (as stated in AS3959) will impact fire behaviour in the Precinct. The aspect of the slope will also significantly impact upon fire behaviour.

3.8 Vegetation

Vegetation within the Precinct and surrounds is a combination of Forest, Grassland, Scrub, Woodland and Low Threat vegetation types, in accordance with AS3959-2018. The Forest vegetation is dominated by native eucalypts with at least 30-70% foliage cover. Significant areas of Forest vegetation have an unmanaged understorey. Forested areas are confined to a part of the eastern boundary of the Precinct, generally extending from the Long Forest Nature Conservation Reserve. The Woodland vegetation includes native eucalyptus vegetation, with trees up to 35m high and a foliage cover of 10-30%. The Grassland includes isolated patches of native grassland and predominant pasture grass associated with grazing. Much of this Grassland could be included as 'Low Threat' vegetation as it is kept in minimal fuel conditions. Several patches of Scrub vegetation are located along the perimeter of the site, abutting steeply incised gullies. Low Threat Vegetation is associated with the existing rural-residential style dwellings in an urban environment within and abutting the Precinct.

A plan detailing the broad vegetation communities is located at Map 3 below. At Attachment 1 is an image record of vegetation and landforms at key accessible sites around and within the Merrimu Precinct. This attachment is linked to Map 4, where the image location and orientation is recorded.



Map 4 – Broad existing vegetation

3.9 Surrounding road network

Proposed access to and from the Merrimu Precinct will be via the following existing roads;

- Bences Rd
- Buckleys Rd
- O'Connell Rd
- Flanagans Drive

These roads access to the west/north the of the Precinct and onto the Gisborne Road, except Flanagans Drive which accesses to the south and onto the Old Western Highway.

The potential bushfire risk from vegetation abutting access roads within and around the Precinct has been assessed in terms of emergency access and egress. It is noted that Bences Road is flanked by grassland vegetation associated with agriculture and rural residential style living. Much of this grassland will be removed on development of the land.

Buckles and O'Connell Roads and Flanagans Drive all partially abut small and isolated patches of managed woodland vegetation. Perimeter roads such as Gisborne Road and Old Melbourne Road are mostly clear of substantial vegetation, but do abut remnant woodland vegetation in a lineal arrangement within the road reserve and immediate surrounds. The woodland vegetation along these roads poses a limited bushfire risk in terms of emergency access and escape routes. The road system provides quick, safe and multiple escape routes onto the Western Freeway, into Bacchus Marsh or to the north-east. These access points also provide quick and convenient access into the Precinct for emergency vehicles.

3.10 Land Use Planning Framework

Ministerial Direction No.11

Ministerial Direction No. 11 - Strategic Assessment of Amendments applies to planning scheme amendments. It is supported by *Planning Practice Note 46: Strategic Assessment Guidelines for preparing and evaluating planning scheme amendments*. In preparing a planning scheme amendment, a planning authority must address any relevant bushfire risk and determine whether the changes proposed will result in any increase to the risk to life, property and community infrastructure from bushfire.

Regional Bushfire Planning Assessment Grampians Region

The *Regional Bushfire Planning Assessment Grampians Region* has been considered in preparing this report. It notes larger rural-residential lots to the north of Merrimu are in the bushfire hazard area associated with Lerderderg State Park to the north and rural-residential lots to the east of Bacchus Marsh are in proximity to bushfire hazard area associated with the Long Forest Flora Reserve to the east.

Planning Policy Framework

The Strategies of the PPF seek to deliver the objective of strengthening the resilience of settlements and communities to bushfire through risk-based planning that prioritise the protection of human life. Specifically, these strategies are:

- *Protection of human life*
- *Bushfire hazard identification and assessment*
- *Settlement planning*

- *Protect areas of high biodiversity conservation value, and*
- *Use and development control in a Bushfire Prone Area*

Local Planning Policy Framework

Clause 22.02 Natural Environment of the Moorabool Planning Scheme acknowledges that large areas of the Shire are at risk of bush fire, particularly forested areas on steep inclines. The objectives of the Clause at 22.02-6 (Bushfire) is to minimise risk of bush fire damage by applying the Moorabool Fire Management Plan.

Bushire Management Overlay

It is noted that only a small section of the Precinct is included in the Bushfire Management Overlay (BMO) of the Moorabool Planning Scheme.

Planning Practice Note 65

Planning Practice Note 65 acknowledges the significant risk that bushfire poses in many parts of Victoria. The purpose of the practice note is to provide guidance about local planning for bushfire protection, assist Councils to tailor the Local Planning Policy Framework in response to bushfire matters where necessary and to provide guidance on how to prepare schedules to the Bushfire Management Overlay.

Moorabool Planning Scheme Amendment C81 Panel

The C81 Panel considered the Bacchus Marsh Urban Growth Framework 2017 (Moorabool Amendment C81). It noted that the key issue for the Merrimu Precinct within the framework area in relation to bushfire was whether the land within the BMO should be included within the Merrimu growth precinct.

The Panel considered it appropriate to exclude the two areas of land currently within a BMO on the eastern side of Merrimu based on a variety of factors, including:

- the topography of the sites
- the extensive vegetation on the sites
- the potential for the sites to include habitat for threatened flora and fauna
- the bushfire risk, including that the land is affected by a BMO
- the advice of a bushfire risk assessment expert
- the recommendations of the CFA
- the requirements of Clause 13.02, including the recent Amendment VC140.

On balance, the Panel believed it was prudent to exclude land from the growth precinct. In accordance with Clause 13.02, the Panel prioritised the protection of human life over all other policy considerations. The Panel accepted the revised Merrimu Precinct as suitable as suitable for future urban development, subject to more detailed planning.

3.11 Moorabool Shire Municipal Fire Management Plan (MFMP)

The primary objectives of the Moorabool Shire MFMP are to:

- Effectively manage and reduce the risk of fire, with a view to protecting life and property and with due regard to our natural environment; and
- Align and integrate existing fire management planning and practices across agencies and the community.

In developing this plan, the MFMP has considered the State priorities as the municipal fire management priorities. They are:

- Protection and preservation of life, including community warnings;
- Educated and informed communities;
- Protection of critical infrastructure and community assets that support community resilience;
- Protection of residential property as a place of primary residence;
- Protection of assets supporting individual livelihoods and economic production that supports individual and community financial sustainability; and
- Protection of environmental and conservation values that consider the cultural, biodiversity, and social values of the environment.

Following these State priorities, the MFMP aims to reduce the number and the severity of fires within the municipality with the intent of creating a more fire resilient community. The MFMP also notes the State priorities, which are underpinned by the primacy of life, the protection of property, the economy and the environment. These priorities inform and are integrated into the primary fire risk management strategies used in this Plan, which are:

- Community education and engagement;
- Hazard reduction;
- Preparedness; and
- Regulatory controls

As the Precinct develops and its land use status alters, the newly emerging residential neighbourhoods will be managed in accordance with the urban area provisions of the MFMP.

3.12 Building Act (Bushfire Prone Areas Mapping - BPA)

The entire site is within the Designated Bushfire Prone Area (BPA). The BPA is determined by the Minister for Planning. The *Building Act 2003* allows for the application of bushfire protection measures. In Merrimu, a building in the BPA must be constructed to a minimum of BAL12.5.

4.0 IDENTIFY THE RISKS

4.1 Bushfire behaviour

A bushfire hazard is determined by vegetation, topography and weather. Identifying the bushfire hazard is a factual and evidence-based process. Local planning for bushfire protection should consider all bushfire hazards that can be potentially harmful, including grasslands and vegetation within and outside of the subject site. Matters such as land tenure and type of development are not relevant factors to determine the bushfire hazard.

There are three typical forms of bushfire attack from a bushfire hazard:

- ember attack which occurs when small burning twigs, leaves and bark are carried by the wind
- radiant heat which can ignite houses and other assets
- direct flame contact involving burning vegetation or other materials directly touching a house or other asset.

The risk from these forms of bushfire attack must all be considered in preparing development plans to effectively limit bushfire threat.

4.2 Bushfire Scenarios in Merrimu

The Merrimu Precinct is subject to several different bushfire risks. Bushfire associated with these risks can occur in isolation (eg localised grassfires) or in a combination (eg large landscape scale bushfire emerging from the north posing a threat and causing localised bushfire through ember attack).

Typical bushfire scenarios that should be anticipated in the Merrimu Precinct are discussed below;

Bushfire scenario	Comment
Bushfire approach Precinct from conservation land to the north-west	<p>To the north and north-west of the Merrimu Precinct is extensive areas of native forest contained within the Lerderderg State Park. These forests extend to Trentham, Bullarto, Lyonville and Daylesford in the north. Fire runs of over 25km are possible from the north and north-west of the site. A bushfire emerging from this forest can pose a significant landscape threat to both the Merrimu Precinct and the broader township of Bacchus Marsh and surrounds.</p> <p>It is noted that the Lerderderg conservation forests are, at their closest point, over 4.0km from the tapered northern extent of the Merrimu Precinct, and separated by an active quarry, road network and cleared and managed grazing land. The land is also generally upslope between the Precinct and the forested land.</p> <p>Given the distance away and the land use and topography in between, it is unlikely that this forest will pose a direct hazard to the Merrimu Precinct. Typical severe fire weather days will produce northerly winds and embers from ignited native vegetation across the wider landscape. The forested areas to the north will therefore pose a significant risk of ember attack during a landscape scale fire. Embers could also result in localised grass fires across the Precinct.</p>

	<p>A large and established grassfire may also approach the northern sector of the Merrimu Precinct from the north or north-east, across abutting grazing land. It is noted that the land is generally flat or upslope to the north. It is also noted that the operating quarry to the west and north-west of the Precinct will limit the spread of bushfire from this direction.</p> <p>It is noted that the CFA offered no objections to the inclusion of the Merrimu Precinct within the proposed growth area, subject to localised bushfire protection measures.</p>
<p>Bushfire approach Precinct from East</p>	<p>The Long Forest Nature Conservation Reserve is located to the east of the precinct. The reserve is an isolated native forest, surrounded by agricultural land and urban and rural infrastructure. It extends around 5km to the north-south and around 3km to the east-west, centred on Pyrites Creek. There is significant rural residential style development on privately owned land immediately abutting the nature reserve containing vegetation managed for bushfire prevention.</p> <p>This reserve is characterised by steeply incised valley of the Pyrites Creek. It is noted that the land slopes generally downward from the edge of the Merrimu Precinct to the east, and into the Pyrites Creek and its tributaries. Vegetation within the reserve and forested freehold land is generally defined as Forest and Woodland, in accordance with AS3959-18. Forest and Woodland vegetation rise from Pyrites Creek with slopes on average of 10 - 15 degree downslope but with some slopes at steeper grades above 35 degrees. Several fingers of classified Woodland vegetation extend into the Precinct from the east.</p> <p>Mitigating against this bushfire scenario as an extreme event is the prevailing conditions during periods of high fire danger. During such periods, typical weather conditions include winds from the north/north-west through to the south-west. Extreme winds from the east and north-east are not expected. Regardless of local weather conditions during the fire danger period, the combination of vegetation types and topographic factors to the east of the Precinct still pose a bushfire risk to the precinct that must be considered and managed.</p>
<p>Localised bushfire</p>	<p>Bushfires can also emerge from within the Precinct. Such fires are usually a result of human activity, which is amplified by the proposed future population expansion but reduced once land is cleared for development.</p> <p>Grassland and woodland vegetation within the Precinct pose a potential bushfire risk. It is noted that the woodland vegetation within the Precinct is isolated from external forest vegetation. The grassland will be progressively managed and removed as the Precinct undergoes urban development. Ember attack from the</p>

	large conservation forests to the north and north-west also pose a risk of localised ignition.
Other bushfire scenarios	<p>Bushfires can also impact the Merrimu Precinct from the west and south-west. Extreme weather conditions on days of high fire danger can result in strong south-westerly winds pushing a fire front from the south-west. However, given the vegetation and land uses to the west (including the quarry) and south, and the physical barrier of the Western Freeway, it is not expected that any bushfire emerging from the south-west will have the fuel or energy to pose a significant bushfire threat to the Precinct.</p> <p>Regardless, bushfire protection measures must be included in any planning that considers a bushfire approaching the site from the south and south-west.</p>

5.0 ANALYSE AND EVALUATE THE RISK

This chapter discusses the broad risks posed by the various acknowledged bushfire scenarios in the Merrimu Precinct. Specific responses are located a Chapter 6.

Bushfire scenario	Comment
Bushfire approach Precinct from conservation land to the north-west	<p>As discussed, it is not considered that the forested vegetation further to the north and north-west will pose a significant, direct bushfire risk to the Precinct during extreme fire-weather conditions. The vegetation immediately abutting the Precinct to the north and north-west is defined as Grassland and Low Threat vegetation as noted in the Bushfire Risk Assessment.</p> <p>However, the size and location of the forested areas further to the north of Bacchus Marsh could pose a significant risk of ember attack during a landscape scale fire. Embers could also result in localised grass fires emerging from the north of the Precinct and threatening the Precinct. The application of BAL12.5 built form controls as part of the Bushfire Prone Area requirements will assist in mitigating against ember attack. Council's Bushfire Emergency Management Plan can also plan for a response to localised and broader bushfire events.</p>
Bushfire approach Precinct from the east	<p>The combination of Forest, Grassland, Scrub and Low Threat vegetation and topographic factors pose a bushfire risk from the east of the Precinct. Slopes and aspects emerging from Pyrites Creek and fronting the Merrimu Precinct vary across the 5km frontage, but generally range up to 15-20 degrees. Significant slopes associated with forest vegetation poses a major bushfire risk in any circumstances. It is noted that the areas likely to be developed are located well-back from the slopes and forest vegetation to the east. The Bacchus Marsh UGF included a specific setback from the Long Forest Nature Conservation Reserve. This have been included in the buffer mapping (Map 5)</p> <p>The inclusion of separation distances and subdivision infrastructure, such as perimeter roadway fronting vegetation types will assist in protecting life and property from the threat of bushfire.</p> <p>All building setbacks should be in accordance with Defendable Space requirements of the Bushfire Risk Assessment and Response Plan. Recommended separation distances can achieve ongoing bushfire protection. Vegetation within the Defendable space must be managed in accordance with relevant Planning Practice Notes.</p>
Localised bushfire	A bushfire can ignite and build within the Precinct itself. Such a bushfire would most likely be in the form of a grassfire, although there is the opportunity for bushfire to emerge in the Precinct from fringing forest, scrub or woodland areas and spread via localised grassfire with the Precinct. The application of BAL12.5

	<p>built form control as part of the Bushfire Prone Area requirements will assist in mitigating against localised grassfires.</p> <p>The application of the subdivision bushfire guidelines, where open space and conservation areas are buffered by a road network will also protect built form from bushfire. Council's adopted Bushfire Emergency Management Plan can be updated to plan and respond to localised bushfire events.</p> <p>Concerning the potential threat posed by bushfire igniting within the Precinct, it is noted that at build-out of the Precinct, many public open space areas will be enclosed by the newly established urban environment. It is expected such areas will be continuously managed in a fire ready state. The inclusion of subdivision infrastructure, such as perimeter roadway or emergency vehicle access tracks fronting all public open space areas will also assist in isolating potential hazard vegetation, thus protecting life and property from bushfire threat. Access to and within the Precinct will also be improved to aid fire-fighting purposes both within the Precinct and its surrounds.</p> <p>Council's Municipal Bushfire Emergency Management Plan will also be updated and plan for a response to localised bushfire events within the Precinct.</p>
Other bushfire scenarios	<p>As stated, bushfires can also impact the Merrimu Precinct from the west and south-west. Whilst fuel loads and fire run potential is limited from these directions, such bushfires still pose a threat to the Precinct.</p> <p>It is noted the escarpment and slopes along the extreme southern boundary of the Precinct, particularly abutting the Western Freeway, can be in over 20 degrees. Vegetation on these slopes is grassland. Separation distances between existing vegetation and development areas must be continuously maintained.</p>

6.0 TRANSLATE RISK MITIGATION INTO PLANNING SCHEME PROVISIONS

6.1 BAL requirements for property protection

Clause 13.02 Bushfire Planning of the Moorabool Planning Scheme must be applied to all planning decisions. Within this Clause, 'Settlement planning' seeks to strengthen the resilience of settlements and communities and prioritise protection of human life by '*Directing population growth and development to low risk locations, being those locations assessed as having a radiant heat flux of less than 12.5 kilowatts/square metre under AS 3959-2009 Construction of Buildings in Bushfire-prone Areas (Standards Australia, 2009)*'.

A combination of ember attack, direct flame contact and radiant heat are all considered to be a source of bushfire impact in the Precinct. By designing the subdivision layout, locating higher risk uses away from potential bushfire hazard areas and mandating a minimum proposed construction standard of BAL12.5 where required, future development in the Merrimu Precinct can be designed to adequately protect both human life and property.

Setbacks distances for the four vegetation types (Forest, Woodland, Scrub and Grassland) are proposed below. Vegetation types and slopes must be further assessed and defined at the subdivision stage. Low Threat Vegetation also abuts the Precinct in the form of a quarry, urban areas and intensive agricultural areas.

Proposed setbacks in the Merrimu Precinct from Classified Vegetation Areas and Escarpments

Vegetation type and slope has been assessed around the boundary of the Development Area of the Precinct through an extensive field survey. A Bushfire Risk Assessment and Response Plan details the outcome of this survey. A photographic record is also included at Attachments 1. All development has been assumed to be built to BAL12.5 standards, with applicable defendable space requirements as per Clause 53.02 of the Moorabool Planning Scheme.

The Bushfire Risk Assessment has considered vegetation within 150m of the area likely to be developed. The Assessment has used Table 1 to Clause 53.02 of the Moorabool Planning Scheme to determine setback requirements from new development. Given the difficulties of accessibility in parts of the Precinct, the strategic nature of this assessment and the varied vegetation types and slopes along the perimeter, the Bushfire Risk Assessment Response Plan has generally assumed the worst-case bushfire scenario. Further in-depth investigation of slope and vegetation type at the final urban structure plan will enable the continued refinement of the risk assessment and the subsequent development area. This may lead to the reduction in setback buffers and the revision of BAL ratings for some sites, subject to building code requirements, where practical.

Regarding the varied vegetation types surrounding the areas of the Precinct likely to be developed, it is noted that Low Threat Vegetation was defined where the likely developable area abutted existing urban uses (low density residential subdivisions) with cleared and managed vegetation associated with dwellings and road reserves. This land use was confined to parts of the eastern boundary of the Precinct, the quarry to the north-west and agricultural land to the south. The field survey confirmed the minimal bushfire threat associated with this land use. Other abutting vegetation types and slopes in the Precinct were assessed as a component of field work investigations and through aerial photography and topographic mapping analysis to determine optimum setback distances for future urban development.

Proposed setback distances determined as a result of these investigations are recorded in the Bushfire Risk Assessment and Response Plan below. Minimum setbacks to the defined vegetation

threat must extend from any building to be used in accordance with land uses listed in ‘Buildings and works’ of Clause 44.06-2 of the Moorabool Planning Scheme. Setback buffers can extend into abutting road reserves. It is noted that drainage and public open space reserves are likely to be positioned on the perimeter of the area likely to be developed. This assists in achieving good urban design outcomes, protects neighbouring amenity and increases the separation distance between future development and the bushfire hazard. Setback buffers will not extend into abutting private land unless the vegetation on this land can be modified to minimise the bushfire hazard, and there is a reasonable assumption that this land will be continually managed for bushfire protection.

As discussed, the primary bushfire threat to the area of the Precinct likely to be developed is along the northern, north-western through to the south-western boundary. The bushfire hazard has been assessed along this frontage, and setback/defendable space recommendations have been made. However, it is noted that some surrounding vegetation (within the Precinct and owned by the developer) can be modified to facilitate the future development of land. This could include the removal of the small and isolated native tree plantation on the north-western corner of the site (measuring three hectares in area), which has been assessed as forest vegetation. The technical bushfire threat posed by this vegetation requires an extensive setback for defendable space purposes. If this forest is removed, the bushfire risk can be re-assessed more favourably.

Also as discussed, a more detailed and localised survey could result in setback buffers being reduced once more knowledge is known of the local bushfire threat. This survey could be undertaken at the development approval stage by the relevant landowner / developer.

6.2 Subdivision Layout

The subdivision layout must be designed to provide a buffer between development areas and the bushfire hazard. Perimeter roads or emergency vehicle access tracks must flank all urban development, providing a means for emergency vehicles to access and work safely in a bushfire area for asset protection and bushfire suppression purposes, provide a ‘hard surface’ physical separation between built form and the fire hazard and allow escape routes away from a bushfire hazard and fire front for both local residents and fire-fighters.

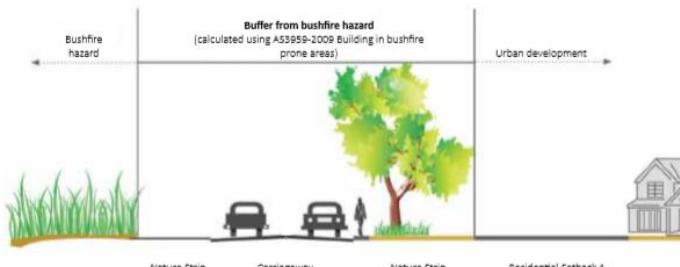
Perimeter roads can be located within open space reserves and provide access to emergency and maintenance vehicles only where reserves are located on the boundaries of the precinct. In these instances, management of the open space reserve in conjunction with the emergency vehicle access track will provide appropriate asset protection and bushfire suppression.

Perimeter roads must be designed in accordance with relevant guidelines, including grades, turning circles, passing areas and road construction. At least two road access points (and escape routes) are required for any site. Cul de sacs should be avoided. Safe and speedy evacuation routes within the Precinct and into Bacchus Marsh should be considered during the subdivision stage.

Examples of using perimeter roads for bushfire protection



Using perimeter roads to deliver bushfire protection in new subdivisions



Note 1: Where the required buffer is greater than the road reserve, the buffer may comprise the front setback in conjunction with vegetation management.

Table 3 – Perimeter road protections - Source: Planning Practice Note 64

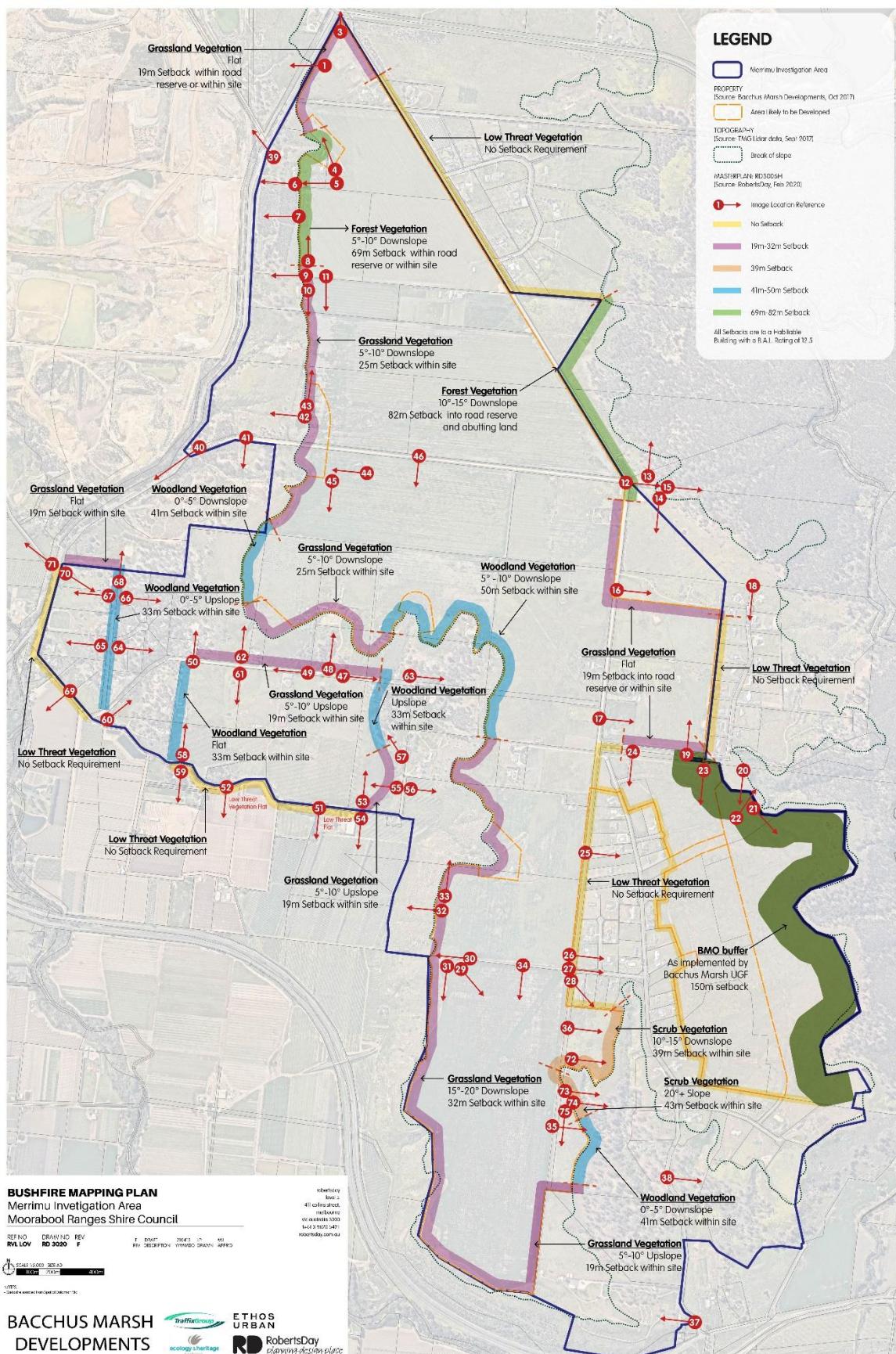
6.3 Location of higher uses

Careful thought should go into locating more sensitive land uses within the Precinct. Ideally, uses such as schools, childcare centres, community centres and retirement homes should not be located directly abutting hazardous vegetation (even with defendable space requirements in place) as the may pose unnecessary risks to occupants and emergency evacuation burdens to the community and authorities. It is noted that these uses often require additional defendable space. Any Neighbourhood Safer Place must be designed to be located away from the bushfire hazard and on a primary transport network.

6.4 Landscape Management

The preparation of this report has considered the vegetation in and around the site in a snapshot as it currently exists. It is observed that vegetation communities are not static, and therefore it must be assumed that vegetation will vary over time. Grasslands can evolve into woodlands and woodlands into forest, and visa-versa.

Whilst defendable space requirements can be continuously managed through planning permit process or though ongoing Council management of open space in a minimal fuel condition, private and abutting vegetation can often evolve. Worst case scenarios have been used when calculating defendable space/setback requirements. The Moorabool Municipal Emergency Management Plan should be used to ensure both public and private vegetation is adequately and continuously managed for bushfire prevention.



Map 5 – Bushfire Risk Assessment and Response Plan

7.0 CONCLUSION

It is considered that the development of the Merrimu Precinct can adequately respond to the bushfire hazard, providing a balanced outcome and net community benefit. Whilst there is a potential ongoing risk from localised grassfire within the Precinct, this can be mitigated by the continued management of open space during the fire season, the gradual removal of grasslands as the Precinct develops and the isolation and buffering of more fire prone vegetation communities.

The risk posed by landscape scale fires from the north and north-west are mitigated by the distance to forested land and the interceding land use, vegetation type and topography. The construction of all new development to a minimum BAL12.5 standard, in accordance with Bushfire Prone Area building requirements, will protect against the risk of ember attack.

The Precinct, particularly to the south and east, is impacted by adjacent escarpments. Any bushfire emerging from these escarpments can be moderated by ensuring adequate setbacks from escarpments and urban design principles that remove habitable buildings from the edge of the escarpment, land use controls and perimeter roads. Setback buffers have been provided for areas of the Precinct likely to be developed. These buffers reflect the current neighbouring vegetation and slopes.

More detailed, site specific investigation of slope and vegetation types will enable the continued refinement of the bushfire risk assessment and the subsequent development area. This will enable future development to be more responsive to the bushfire risk, and may lead to the reduction in setback buffers and/or the revision of BAL ratings for some sites. These matters will be addressed in the final urban structure plan.

In summary, the Merrimu Precinct can be designed to respond to and mitigate the bushfire risk posed by both the surrounding landscape and vegetation within the Precinct, thus ensuring the impact on life and property from bushfire is reduced to an acceptable level in accordance with Clause 13.02 of the Moorabool Planning Scheme.

ATTACHMENT 1 – SITE PHOTOS



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7



Photo 8



Photo 9



Photo 10



Photo 11



Photo 12



Photo 13



Photo 14



Photo 15



Photo 16



Photo 17



Photo 18



Photo 19



Photo 20



Photo 21



Photo 22



Photo 23



Photo 24



Photo 25



Photo 26



Photo 27



Phot 28



Photo 29



Photo 30



Photo 31



Photo 32



Photo 33



Photo 34



Photo 35



Photo 36



Photo 37



Photo 38



Photo 39



Photo 40



Photo 41



Photo 42



Photo 43



Photo 44



Photo 45



Photo 46



Photo 47



Photo 48



Photo 49



Photo 50



Photo 51



Photo 52

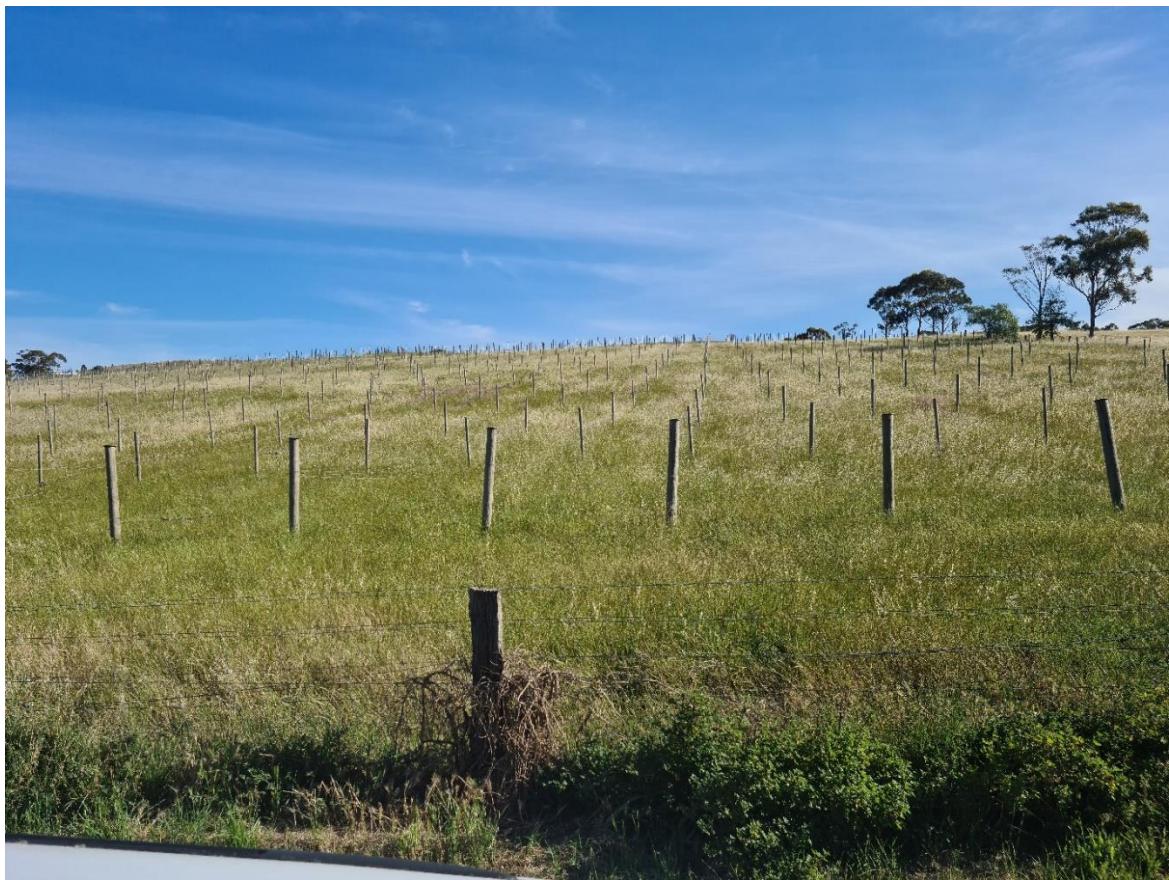


Photo 53



Photo 54



Photo 55



Photo 56



Photo 57



Photo 58



Photo 59



Photo 60



Photo 61



Photo 62



Photo 63



Photo 64



Photo 65



Photo 66



Photo 67



Photo 68



Photo 69



Photo 70



Photo 71



Photo 72



Photo 73



Photo 74



Photo 75