

# Bushfire Planning Assessment South Stawell Growth Area

Draft report

26 February 2024

**Version 0.1**

**Prepared for:**

Northern Grampians Shire Council

59-69 Main Street

Stawell Victoria 3380

# Contents

1.	Introduction	Page 3
1.1.	Background to the South Stawell Growth Area	Page 7
2.	Planning scheme bushfire context	Page 15
3.	Bushfire hazard landscape assessment	Page 19
4.	Landscape bushfires to be anticipated	Page 34
5.	Exposure to bushfire at the neighbourhood and local scale	Page 40
6.	Design response in bushfire hazard areas	Page 45
7.	Assessment against c13.02-1S Bushfire Planning and other bushfire provisions	Page 51
8.	Recommendations	Page 54
9.	Views of the relevant fire authority	Page 57
	References	Page 58

## About

██████████ *Bushfire Planning* is a town planning service that works with public and private sector clients to understand and apply planning scheme bushfire policies and requirements. It is led by Kevin Hazell who is a qualified town planner with extensive experience working on bushfire planning at State and local levels.

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## Disclaimer

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## Version Control

Version	Date	Comment	Name
v0.1	26 February 2024	Draft report	██████████ ██████████

# 1. Introduction

██████████ Bushfire Planning has been engaged by Northern Grampians Shire Council (the 'Council') to prepare a bushfire assessment for the South Stawell Growth Area and to consider bushfire policies in c13.02-1S Bushfire Planning of the Northern Grampians Planning Scheme (the 'planning scheme').

The assessment is intended to inform the preparation of a masterplan being prepared by Hansen Partnership. An initial draft masterplan has been prepared which will evolve in response to technical inputs, including from this bushfire assessment. This is outlined in more detail in Chapter 1.1.

## 1.1 Background to the bushfire assessment

The request for quotation issued by the Council included the following:

*Northern Grampians Shire Council (NG Shire) adopted the Stawell Structure Plan in 2021.*

*Action A2.2 of the Structure Plan is to "Further investigate land marked as 'Urban Growth Area' to understand the likely opportunities and constraints of this land to accommodate long term housing supply. Facilitate rezoning as demand arises and once opportunities are understood. A Development Plan Overlay (DPO) should be applied to the land to ensure it develops cohesively and in a logical manner as identified (in this map of the growth area)."*

*Council intends that the masterplan will be included into the NG Planning Scheme and will be basis for future rezonings for more intensive housing and other urban uses.*

*Hansen Partnership have been engaged to prepare a long-term masterplan for the growth area. Their work began in March 2023 and is expected to conclude at the end of 2023. The growth area is shown in the following map from the Structure Plan.*

The objectives for this bushfire assessment is set out as follows:

*The objectives of this investigation into managing bushfire risk as the masterplan is implemented are:*

- *Produce a high level landscape bushfire risk assessment for the growth area and its context.*
- *Recommend any further measures to manage bushfire risk in addition to the existing provisions, including the Bushfire Management Overlay (BMO).*

- *Make recommendations on whether the draft masterplan needs to be modified to ensure that Clause 13.05-1S Bushfire Planning of the Planning Scheme is met.*
- *Provide advice to Council and Hansen Partnership on bushfire risk mitigation measures that could dovetail with other strategies in the masterplan, such as location of open space, collector roads or other urban features, and proposed staging.*
- *Obtain a Country Fire Authority (CFA) perspective on the high level landscape bushfire risk assessment for the growth area and any recommendations arising from that assessment.*

## 1.2 Study Area

The Study Area is the South Stawell Urban Growth Area as defined in the Stawell Structure Plan 2021. It is referred to in this report as the *Study Area*.

See:

**Figure 1A: Locality map with Study Area**

**Figure 1B: Locality aerial photo with Study Area and land parcels**

## 1.3 Methodology for this report

c13.02-1S Bushfire Planning includes strategies that inform how bushfire hazards are to be assessed and for considering where and how growth and new development should occur. Having regard to these strategies, this report responds to the scope of work as follows:

- Section 1.1 provides background on the strategic and settlement planning context of the Study Area.
- Section 2 provides an overview of bushfire content in the planning scheme, including the strategies in c13.02-1S Bushfire Planning.
- Section 3 describes the bushfire context using a range of information sources, mostly arising from the work of public authorities such as fire authorities and the Council.
- Section 4 describes landscape bushfire hazards that may influence the locality, similar to the approach for a bushfire hazard landscape assessment described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017). This includes the identification of landscape types that help understand the relative risk between different places within the Study Area.

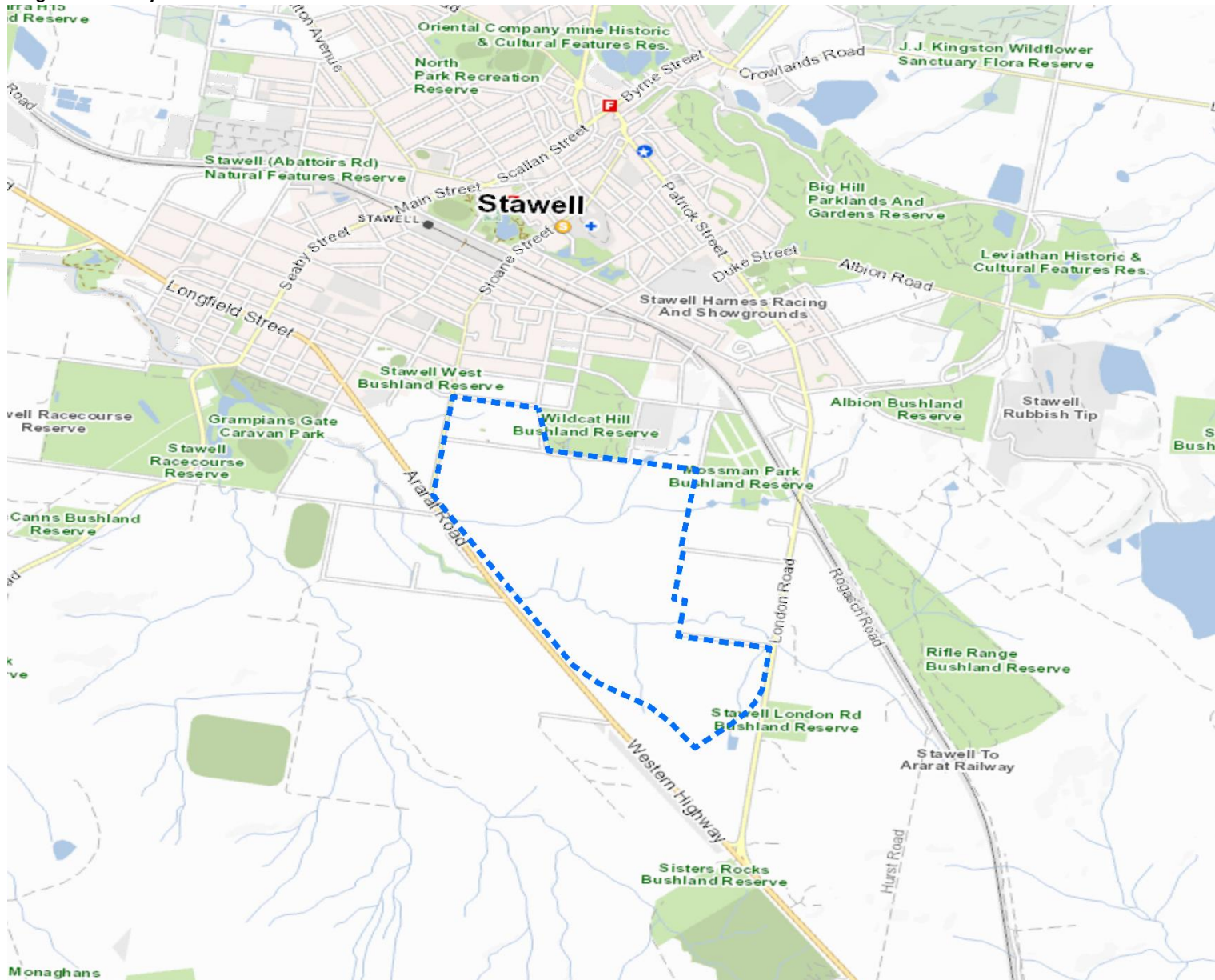
- Section 5 describes the bushfire hazard at the neighbourhood and local scale. This is informed by the methodology for a bushfire hazard site assessment as described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017) and *AS3959-2018 Construction of buildings in bushfire-prone areas* (Standards Australia).
- Section 6 includes a discussion on design responses to bushfire using *Design Guidelines: Settlement Planning at the Bushfire Interface* (DELWP 2020).
- Section 7 and 8 includes a discussion and recommendations, including an assessment of the objectives and strategies in *c13.02-1S Bushfire Planning*.

#### **1.4 How to use this report**

The bushfire assessments have been prepared to inform decision making associated with strategic planning and the strategic application of *c13.02-1S Bushfire Planning*. The bushfire assessments do not consider bushfire for the purpose of planning applications, including under *c44.06 Bushfire Management Overlay*.

Recommendations in this report only have regard to bushfire considerations. The Council will use these recommendations alongside other considerations in determining where and how development can occur. A recommendation in this report does not preclude the necessity for non-bushfire factors to be applied and which may, ultimately, make a recommendation in this report neither feasible or deliverable.

Figure 1A: Study Area



 Study Area

Date: 06/02/2024

Figure 1B: Study Area aerial photo and land parcels



## 1.1 Background to the South Stawell Growth Area

The Northern Grampians Planning Scheme provides an appreciation of how settlements and growth are currently planned in Northern Grampians Shire, as derived from State, regional and local planning policies.

### 1.1.1 Municipal Planning Strategy

The Municipal Planning Strategy at c02.01 describes Northern Grampians Shire as follows:

*Northern Grampians Shire is located in the Wimmera Southern Mallee Region of Victoria, and shares its boundaries with Yarriambiack Shire and Buloke Shire to the north, the Loddon Shire, Central Goldfields Shire and Pyrenees Shire to the east, the Rural City of Ararat and Southern*

*The majority of the shire's population reside in the major towns of Stawell and St Arnaud. Halls Gap is a significant regional town and the small settlements of Great Western, Navarre, Stuart Mill, Marnoo and Glenorchy provide important focal points for local communities.*

The strategic directions for settlements at c02.03-1 includes the following for Stawell:

*Stawell has a diverse range of land uses, with industries interspersed with residential uses. The major industrial land uses include gold mining, brick making, and meat processing. The resulting land use conflicts are being managed by locating industry in specific areas with the appropriate infrastructure.*

*Stawell contains an established network of open space comprising of both active and passive recreational areas and bushland reserves. The dwelling types within Stawell are mixed and are generally on large lots.*

*Stawell's close relationships with Ararat provides an opportunity to develop the towns as a cohesive sub-regional cluster of housing, employment and services.*

c02.03-3 Environmental risk and amenity includes content on bushfire:

*Land in the shire is subject to environmental risks such as bushfire, landslides, flooding and salinity.*

*Bushfire is a hazard in the shire and around townships, with Halls Gap and land around Kara Kara State Forest being at high risk.*

*Strategic directions - Ensure land use and development does not increase the level of bushfire risk and includes*

### 1.1.2 Context from the Planning Policy Framework

c10-19 includes State, regional and local policies within the *Planning Policy Framework*.

*11.01-1L Settlement – Northern Grampians*

*Strategies – Stawell*

*Encourage residential development to be located in the south east of the town, and north of the Western Highway.*

*18.01-1L – Western Highway*

*Strategies*

*Design or layout use and development in the vicinity of the Western Highway to allow convenient and safe movement for residents and workers to access other localities within the shire while minimising the use of the highway.*

See **Figure 1.1A: c11.01-1L Stawell Strategic Framework Plan**

### 1.1.3 The Stawell Structure Plan (March 2021)

The *Stawell Structure Plan* (March 2021) has been prepared. It includes the following description of Stawell.

*Stawell is located within the Wimmera Region of Victoria, approximately 236km to the west of Melbourne. It is the main settlement in the Northern Grampians Shire. According to the 2016 Census, Stawell had a residential population of 6,052 persons. The town sits to the northeast of the Grampians National Park and plays a large role in regional tourism.*

[...]

*The township of Stawell has historically serviced mining and agricultural industries operating in the region. While it continues to service these industries, it also services the local community and tourism activity in the broader Grampians region. The historic mining activity remains socially and economically important for the township, with the Stawell Gold Mine continuing to function.*

[...]

*The landscape and environmental character of Stawell is underpinned by the many bushland reserves surrounding the township and the present views to the surrounding Grampians National Park. High points in the township and surrounds include the Big Hill Lookout, offering panoramic views across Stawell, the Big Hill Parklands and Gardens Reserve. Proud public gardens throughout Stawell contribute to its strong public amenity.*

A future urban structure diagram is included in the Stawell Structure Plan.

**See Figure 1.1B: Stawell Structure Plan – Future Urban Structure**

The Stawell Structure Plan provides for the following urban growth area, which is the study area for this bushfire report:

*The main long term growth front of Stawell has been identified south of the township along Sloane Street. It is likely that this land can accommodate the majority of Stawell's greenfield development demand over the next 30 years and beyond.*

*The 135ha precinct has the potential to accommodate approximately 800 to 1,200 new dwellings based on a high level yield assessment that assumes a residential Net Development Area (NDA) equal to 60% of the entire precinct and residential density of 10 to 15 dwellings per net hectare. This is based on a very high level assessment and subject to further detailed investigations to determine the actual NDA and density.*

*It is important that this land is planned cohesively for long term growth and is protected from subdivision and development that would jeopardise its future growth potential. Rezoning should be undertaken sequentially as demand dictates.*

[...]

*Objectives*

- *O2.4 – To focus new greenfield development within Stawell's township boundary to the south of the town centre to avoid more sensitive locations.*

*Strategies*

- *S2.3 - Direct new greenfield development into the identified 'Urban Growth Area' area south of the town along Sloane Street. A priority should be placed on the existing GRZ land in this location.*
- *S2.4 - Development of new greenfield sites should provide for a range of lot sizes, densities, and housing types which reflect the needs of the community*

A diagram of the South Stawell urban growth area is included in the Stawell Structure Plan.

**See Figure 1.1B: Stawell Structure Plan – Future Urban Structure**

#### **1.1.4 Emerging draft growth area framework**

A draft growth area framework diagram has been prepared which will evolve in response to technical inputs, including from this bushfire assessment. It provides an initial understanding of how the South Stawell growth could development, building on the content in the Stawell Structure Plan.

**See Figure 1.1D Stawell Growth Area Framework – Potential Key Directions diagram**

#### **1.1.5 Planning scheme Zones**

Planning scheme policies are given effect to through the application of Zones. The Study Area is currently contained in the Rural Living Zone 2 and some areas, oriented to Sloan Road, area in a General Residential Zone 1 and Neighbourhood Residential Zone 1.

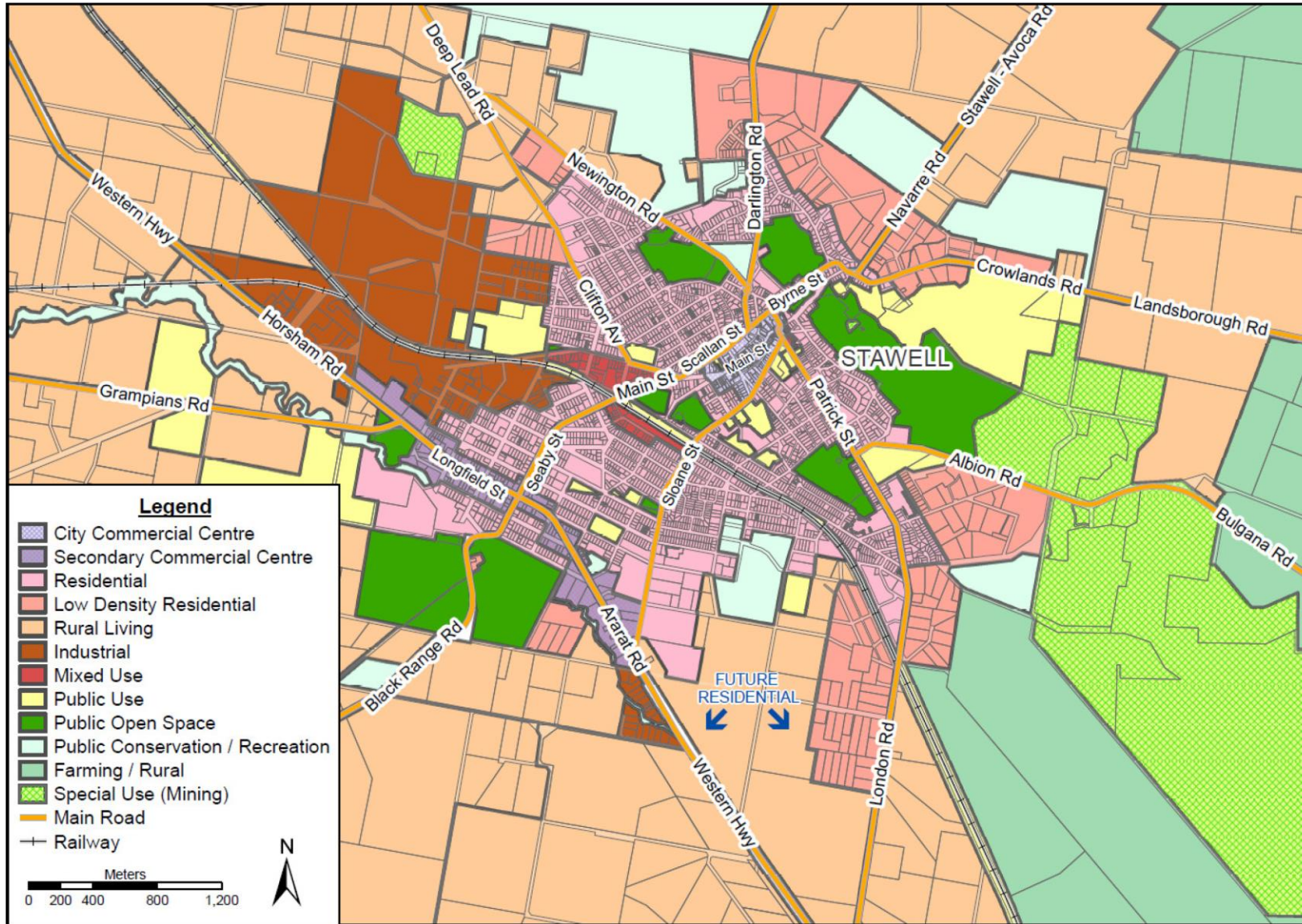
**Figure 1.1E Zones**

The south-easter boundary of the Study Area is defined by land within the Public Acquisition Overlay. The acquiring authority is the Roads Corporation (VicRoads) and the purpose is for the Western Highway Project: Section 3 – Ararat to Stawell.

**Figure 1.1F: Public Acquisition Overlay**



Figure 1.1A: c11.01-1L Stawell Strategic Framework Plan



Source: Northern Grampians Planning Scheme

Figure 1.1B: Stawell Structure Plan – Future Urban Structure

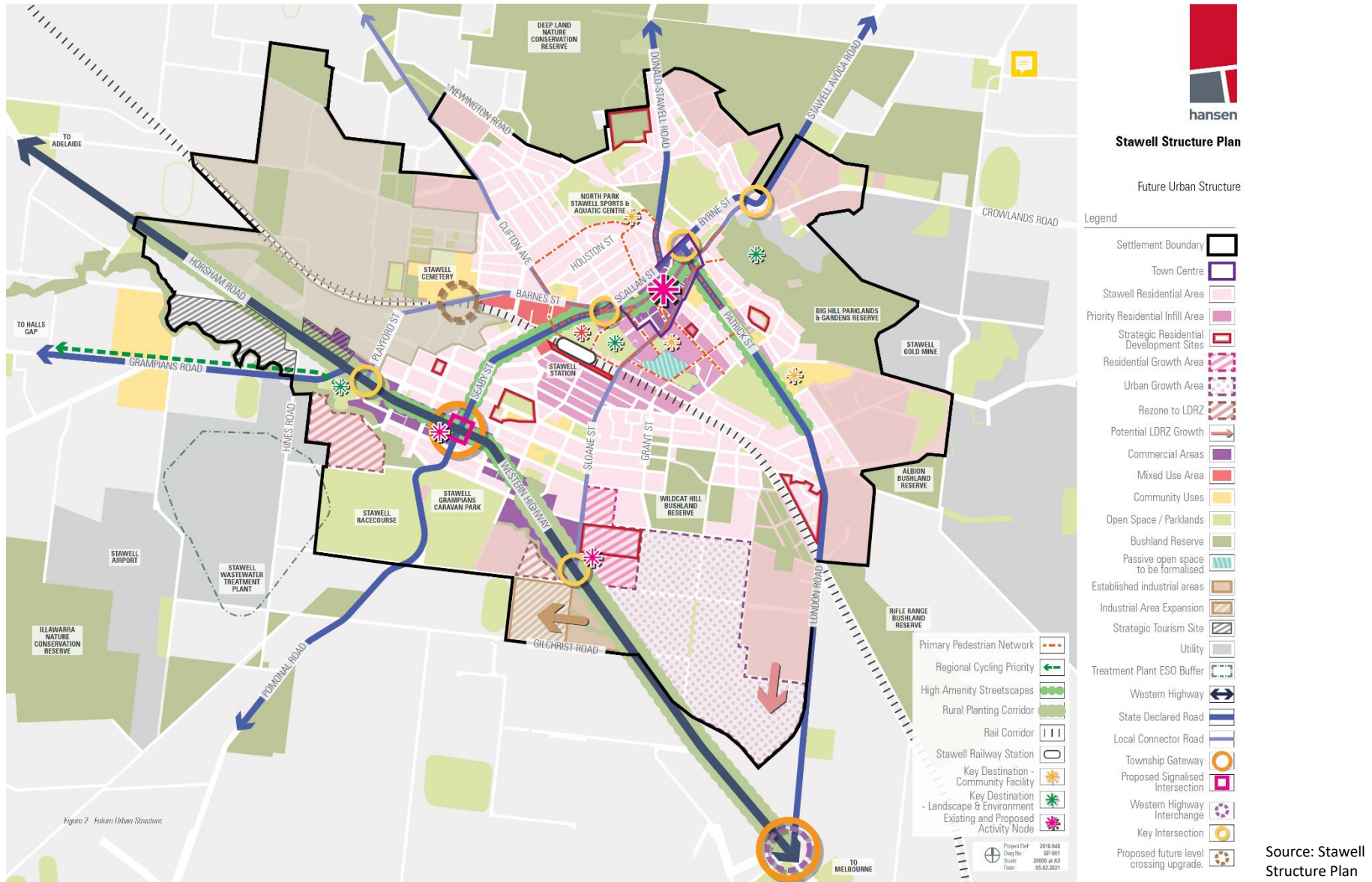


Figure 1.1C: Stawell Structure Plan – Urban Growth Area



Source: Stawell Structure Plan

Figure 1.1D: Stawell Growth Area Framework – Potential Key Directions diagram May 2023

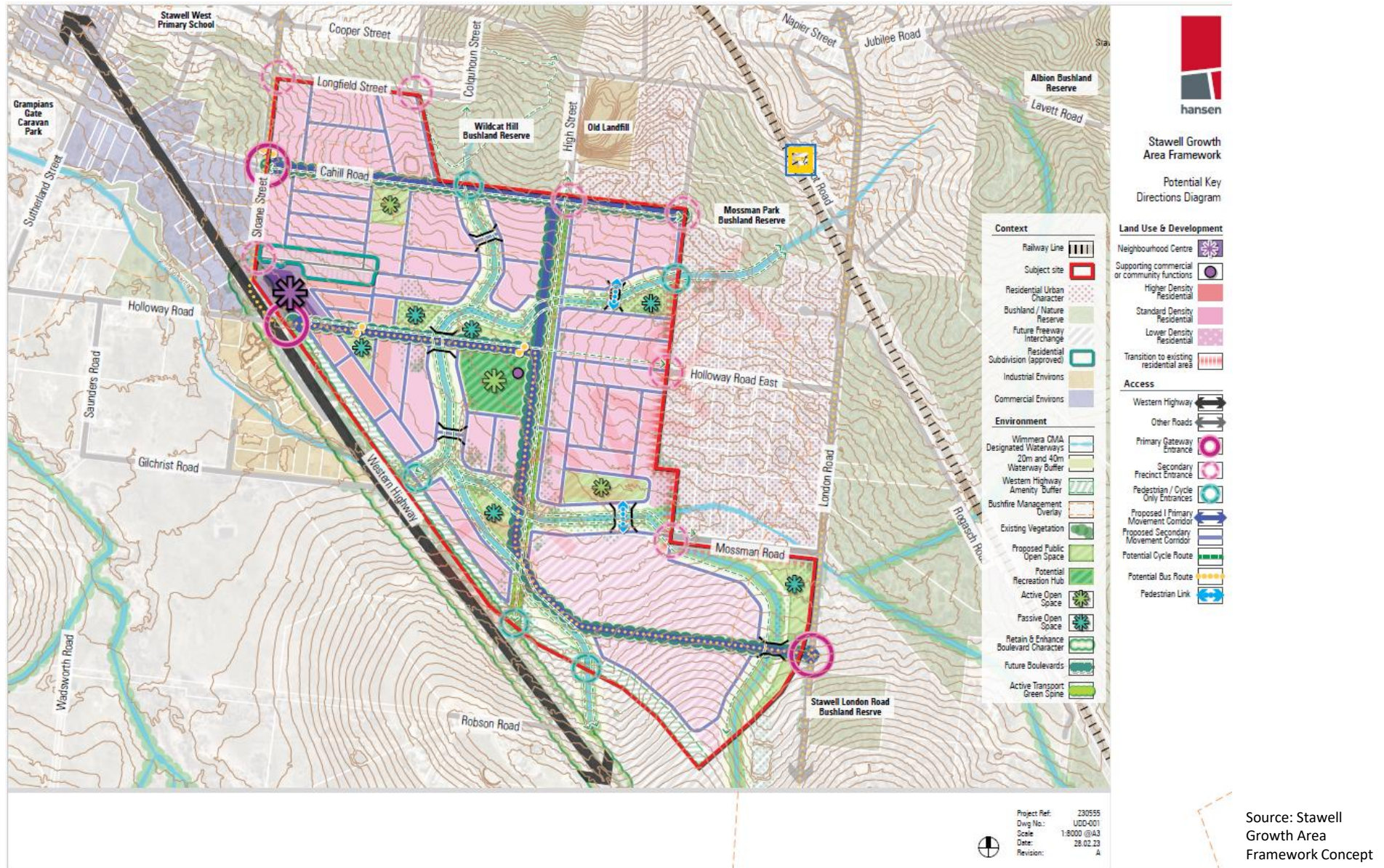
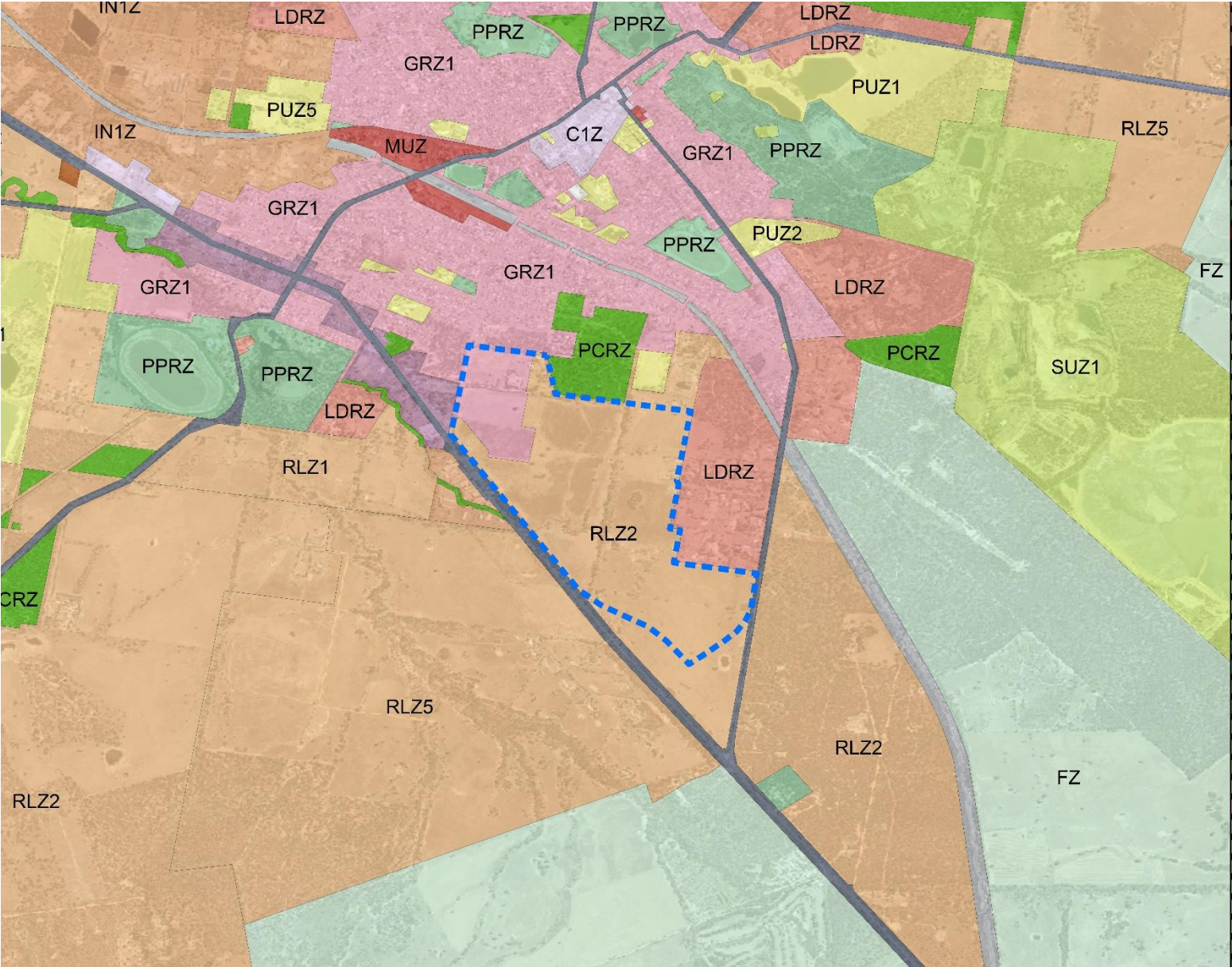


Figure 1.1E: Zones




Study Area

Date: 6/2/2024

Figure 1.1F: Public Acquisition Overlay



 Study Area

 Public Acquisition Overlay

Date: 6/2/2024

## 2. Planning scheme bushfire context

The planning scheme contains provisions that inform permit requirements, application requirements and policies & decision guidelines where the bushfire hazard could be an influence on future land use and development. This section provides an overview of these provisions. Figure 2 summarises the considerations.

### 2.1 Integrated decision making (c71.02-3)

c71.02-3 requires planning authorities, in bushfire areas:

*[T]o prioritise the protection of human life over all other policy considerations.*

Bushfire considerations are not to be balanced in favour of net-community benefit, as occurs for all other planning scheme matters. The bushfire emphasis in c71.02-3 was introduced through Amendment VC140 in December 2017. Such policy settings were recommended in 2011 by the *2009 Victorian Bushfires Royal Commission*.

### 2.2 Natural hazards and climate change (c13.01-1S)

The objective of the State natural hazards and climate change policy is:

*To minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning.*

c13.01-1S *Natural hazards and climate change* contains a series of strategies to meet the above objective:

- *Respond to the risks associated with climate change in planning and management decision making processes.*
- *Identify at risk areas using the best available data and climate change science.*
- *Integrate strategic land use planning with emergency management decision making.*
- *Direct population growth and development to low risk locations.*
- *Develop adaptation response strategies for existing settlements in risk areas to accommodate change over time.*
- *Ensure planning controls allow for risk mitigation and climate adaptation strategies to be implemented.*
- *Site and design development to minimise risk to life, property, the natural environment and community infrastructure from natural hazards.*

### 2.3 State planning policy for bushfire (c13.02-1S)

The objective of the State planning policy for bushfire is:

*To strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.*

The key strategy that directs bushfire decision making is:

*Give priority to the protection of human life by:*

- *Prioritising the protection of human life over all other policy considerations.*
- *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*
- *Reducing the vulnerability of communities to bushfire through the consideration of bushfire risk in decision making at all stages of the planning process.*

c13.02-1S *Bushfire Planning* applies to all planning and decision making relating to land:

- *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.*

c13.02-1S *Bushfire Planning* contains a series of strategies and these are summarised below.

#### Landscape bushfire considerations

c13.02-1S *Bushfire Planning* requires a tiered approach to assessing the hazard:

- *Considering and assessing the bushfire hazard on the basis of [...] landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site;*
- *Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.*

### Alternative locations for development

c13.02-1S *Bushfire Planning* includes two strategies that seek to direct new development:

- Give priority to the protection of human life by [...] directing population growth and development to low risk locations [.]
- Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.

### Availability and safe access to areas of enhanced protection

c13.02-1S *Bushfire Planning* requires a location in easy reach that provides better protection for life from the harmful effects of bushfire:

- Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS3959-2018 *Construction of buildings in bushfire-prone areas (Standards Australia)* where human life can be better protected from the effects of bushfire.
- Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.

### The views of the relevant fire authority

c13.02-1S *Bushfire Planning* identifies that a key element of a risk assessment is to:

- Consult [...] with [...] the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.

### Site based exposure

c13.02-1S *Bushfire Planning* provides policy directions for planning authorities about the level of acceptable exposure for new development enabled by a planning scheme amendment:

- 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 AS3959-2018 *Construction of buildings in bushfire-prone areas (Standards Australia)*.
- Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS3959-2018.

### Areas of high biodiversity conservation value

c13.02-1S *Bushfire Planning* provides directions on situations where a bushfire risk and biodiversity values are both present:

- Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value.

### No increase in risk

c13.02-1S *Bushfire Planning* provides an overall view of acceptable risk:

- Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.
- Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reduce bushfire risk overall.

## **2.4 Bushfire Management Overlay (c44.06)**

The purpose of the Bushfire Management Overlay is:

- To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.
- To identify areas where the bushfire hazard warrants bushfire protection measures to be implemented.
- To ensure development is only permitted where the risk to life and property from bushfire can be reduced to an acceptable level.

The Bushfire Management Overlay is generally applied to patches of vegetation (except grasslands) that are larger than 4 hectares in size. Where such a patch of vegetation exists, a 150 metre ember protection buffer is added and this land is also included in the Bushfire Management Overlay. Areas of extreme hazard are also included in the Bushfire Management Overlay.

*Planning Advisory Note 46: Bushfire Management Overlay Methodology and Criteria* (2013, DPTLI) provides more information on where the Bushfire Management Overlay is applied.



## 2.5 Bushfire Planning (c53.02)

c52.03 *Bushfire Planning* specifies the requirements that apply to a planning application under c44.06 Bushfire Management Overlay. The purpose of this provision is:

- *To implement the Municipal Planning Strategy and the Planning Policy Framework.*
- *To ensure that the development of land prioritises the protection of human life and strengthens community resilience to bushfire.*
- *To ensure that the location, design and construction of development appropriately responds to the bushfire hazard.*
- *To ensure development is only permitted where the risk to life, property and community infrastructure from bushfire can be reduced to an acceptable level.*
- *To specify location, design and construction measures for a single dwelling that reduces the bushfire risk to life and property to an acceptable level.*

## 2.6 Bushfire prone area (c13.02-1S, Building Act 1993 & Building Regulations 2018)

Bushfire Prone Areas are areas that are subject to or likely to be subject to bushfire. The Minister for Planning makes a determination to designate Bushfire Prone Areas under section 192A of the Building Act 1993.

Designated Bushfire Prone Areas include all areas subject to the Bushfire Management Overlay. Bushfire Prone Areas also include grassland areas and, occasionally, smaller patches of non-grassland vegetation.

The Building Regulations 2018 require bushfire construction standards in these areas and these are implemented by the relevant building surveyor as part of the building permit. These construction standards are referred to as bushfire attack levels (BAL).

Where land is included in the Bushfire Prone Area is also included in the Bushfire Management Overlay, the requirements of the Bushfire Management Overlay take precedence. Where this is the case, the building regulations ensure bushfire construction requirements in a planning permit are given effect to by the relevant building surveyor at the time a building permit is issued.

## 2.7 Use and development control in Bushfire Prone Areas (c13.02-1S)

c13.02-1S *Bushfire Planning* includes planning requirements for Bushfire Prone Areas. These are in the form a 'use and development control' that applies to certain uses that are in a Bushfire Prone Area.

The use and development control applies to Subdivisions of more than 10 lots, Accommodation, Child care centre, Education centre, Emergency services facility, Hospital, Indoor recreation facility, Major sports and recreation facility, Place of assembly, and any application for development that will result in people congregating in large numbers.

The use and development control requires that when assessing a planning permit application:

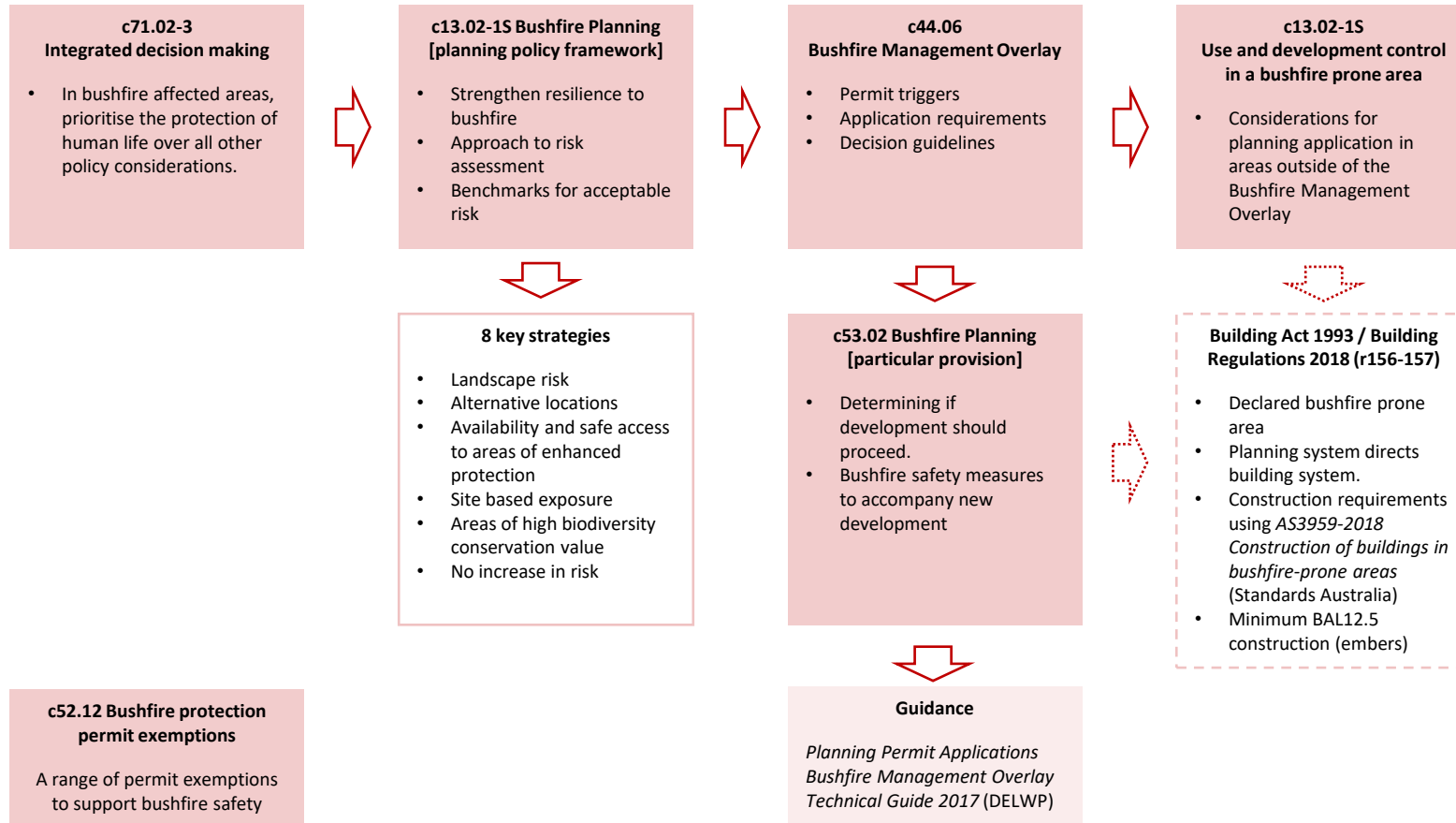
- *Consider the risk of bushfire to people, property and community infrastructure.*
- *Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts.*

## 2.8 Bushfire protection permit exemptions (c52.12)

Bushfire related permit exemptions are included in c52.12 *Bushfire protection exemptions*. Exemptions are included for the following matters:

- Permit exemptions to create defendable space around existing buildings used for accommodation. They apply to bushfire prone areas, which includes land subject to the Bushfire Management Overlay. These are commonly known as the 10/30 rule and the 10/50 rule. This exemption applies to accommodation constructed or approved on or before 2009.
- Permit exemptions to create defendable space for a dwelling under the Bushfire Management Overlay, where the defendable space is specified in a planning permit issued after 31 July 2014. The permit exemption only applies to specified zones, which include residential zones. The permit exemption does not apply to defendable space specified in a planning permit for uses other than a dwelling and for any uses outside of the Bushfire Management Overlay.
- Permit exemptions for buildings and works associated with a community fire refuge and a private bushfire shelter (where a Class 10c building).

Figure 2: Planning scheme bushfire provisions and supporting material



### 3. Bushfire hazard landscape context

This Chapter describes the bushfire context of the Study Area using a range of information sources that help understand bushfire. The matters identified include information typically provided as part of a bushfire hazard landscape assessment as described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017).

The extent of the surrounding landscape that is relevant is determined by the bushfire hazard that may influence a locality. This includes the extent and continuity of vegetation, potential fire runs, where a bushfire can start, develop and grow large, and areas where enhanced safety from a bushfire may be available (including through evacuation).

#### 3.1 Bushfire Weather

##### 3.1.1 Bushfire weather in Victoria

The Department of Environment, Land, Water and Planning (DELWP) (2015) identifies key features relevant to bushfire weather in Victoria. These include:

- A forest fire danger index of well over 100
- Severe drought conditions
- Temperatures above 40° C
- Relative humidity below 10%
- Strong to gale-force north-westerly winds
- A strong to gale-force west-south-westerly wind change that turns the eastern flank of a running bushfire into a wide new fire front.

DELWP notes that these weather conditions are representative of where a bushfire does most of its damage in a single day. The greatest loss of life and property have historically been caused by such single day bushfires. The landscape assessment assumes these conditions as the basis for landscape scale hazard assessments.

CFA (2023) describes wind as an important influence on bushfire, with wind influencing:

- Speed at which a fire spreads
- Direction in which a fire travels and the size of the fire front
- Intensity of a fire – wind provides more oxygen
- Likelihood of spotting (ember attack ahead of the main fire front).

A change in wind direction is one of the most dangerous influences on fire behaviour. Many people who die in bushfires get caught during or after a wind change. In Victoria, hot, dry winds typically come from the north and northwest and are often followed by a southwest wind change. In this situation the side of the fire can quickly become a much larger fire front.

##### 3.1.2 Bushfire weather and climate change

DELWP (2020) identifies that climate change is forecast to:

- Extend the bushfire season
- Make bushfires larger, more severe, and more frequent
- Make days with an elevated fire danger rating more frequent
- Start the bushfire season earlier, with more bushfires starting in spring (which may also change fire weather conditions that are experienced, such as wind speed and direction).

This is reinforced by the CSIRO (2020) which concluded that changing fire weather is likely to result in:

- Longer fire seasons, arriving earlier in spring most notably
- Accompanied by more extreme heatwaves, including in spring
- Lower rainfall during the cooler months in some fire prone regions of the [...] southeast [of Australia]
- Hotter drought periods
- Evidence of more favourable environments for fire generated thunderstorms.

The *Royal Commission into National Natural Disaster Arrangements (2020)* concluded:

*[...] [T]here may also be a trend towards more weather-dominated fire events. In weather-dominated events, fires interact with the atmosphere resulting in unpredictable and extreme fire behaviour. The most extreme of these are known as firestorms or pyrocumulonimbus (pyroCb) events, which can be associated with extraordinarily destructive fire behaviour.*

#### 3.2 Slope & Topography

Slope under hazardous vegetation informs how fast a bushfire may travel. The CFA (2023) identify the following characteristics of slope:

- *A fire will burn faster uphill. This is because the flames can easily reach more unburnt fuel in front of the fire.*

- *Radiant heat pre-heats the fuel in front of the fire, making the fuel even more flammable.*
- *For every 10° slope, the fire will double its speed.*
- *By increasing in speed the fire also increases in intensity, becoming even hotter.*
- *Fires tend to move more slowly as the slope decreases.*

Slope and topography show mostly flat and undulating land within the Study Area and close (1-2 kms) of the Study Area. Some areas of more slope arises to the north of Stawell and in the vegetation areas to the south of the Study Area. However, these area are not significant to the appreciation of bushfire within the Study Area.

Analysis of bushfire behaviour indicates that extreme bushfire behaviour is more likely to arise in locations where there is steep and rugged terrain. The potential for extreme bushfire behaviour is a key input to planning decision making because it helps appreciate where large bushfires will arise and where the most damage from bushfire may occur (including neighbourhood scale destruction).

Based on the topography in the landscape around the Study Area, it is reasonable to conclude that extreme bushfire behaviour is not likely to arises based on slope and topography of land.

See:

**Figure 3A: Slope based on the 10m contour**

**Figure 3B: Elevation based on the 10m contour**

### 3.3 Vegetation

#### Ecological Vegetation Classes (EVC)

Ecological vegetation classes (2005) are identified in many parts of the Study Area and in the wider landscape.

See: **Figure 3C: Ecological Vegetation Classes**

EVC include:

- Box Iron Bark Forest to the north of the Study Area.
- Plains Grassy Woodland on the Study Area and to its east and south.
- Heathy Woodland on the Study Area and to the south / south-east.

#### Vegetation types for planning scheme decision making

The Bushfire hazard site assessment is a planning scheme tool (reference in *c53.02 Bushfire Planning*) for assessing bushfire hazards. It uses (in part) the vegetation types and classification in *AS3959-2018 Construction of buildings in Bushfire Prone Areas* (Standards Australia 2018).

Vegetation for bushfire analysis is different than for other purposes, such as EVCs, landscape value or biodiversity, although the extent of vegetation will often correlate.

Vegetation types for planning scheme decision making are:

- Forest
- Woodland
- Scrub
- Shrubland
- Mallee / Mulga
- Grassland
- Modified vegetation

At the site-scale, using the above classifications is localised perspective on the bushfire hazard and there is no strategic map that seeks to show these classifications. Instead, more localised assessments (such as of a settlement or neighbourhood) would identify classifiable vegetation based on field observations.

Nonetheless, there are two dominant vegetation types in the Study Area that are most informative to landscape bushfire behaviour.

#### *Forests*

Forest under *AS3959-2018 Construction of buildings in Bushfire Prone Areas* (Standards Australia 2018) is dominant in the treed areas in the landscape.

Forest is described by the CFA (2014) as follows:

*Forests occur throughout Victoria and encompass great floristic diversity. Forests are generally characterised by tall, straight trees, but there is a great degree of variability in forests. Forests are described by the BMO as having multiple layers of vegetation, including a pronounced shrubby middle layer in addition to a taller canopy and an underlying layer of grasses, herbs or sedges.*

*Although normally defined by the highest layer of trees having a canopy cover of greater than 30%, this can in practice be difficult to discern, particularly in more open situations. In addition, taller woodlands may have a secondary tree layer just below the dominant tree canopy and are therefore also treated as forests. Shrubby variants can be low-growing in the dry forests, or tall and dense in the wet forests. Grassy variants often have a high diversity and cover of herbs. Grasses are dominated by Wallaby grass and Spear grass species.*

*Of particular interest are heathy woodlands, which may not be tall, but have significant fuel loads in the mid layers. Heathy woodland canopies can grow close together, so are treated as forests.*

*Plantations of pine and blue gum have also been included as forests. Fire behaviour in plantations can be highly variable depending on management regimes. Pine plantations can have very high fuel loads without shrubby layers, due to the tree structure having branches near ground level, providing almost continuous fuel from the ground to the top of the canopy.*

In progressing localised hazard assessments, there may be circumstances where areas of woodland rather than forest is better assessed at the local or site scale. This reflects that there is a transition between forests and woodland and the distinction is not self-evident in all cases.

#### *Grasslands*

Grasslands under AS3959-2018 *Construction of buildings in Bushfire Prone Areas* (Standards Australia 2018) are the other region / Study Area dominant vegetation type. They dominate in the Victorian Volcanic Plain and Warrnambool Plain and in areas of the Otway Plain and Otway Ranges which are not heavily treed.

Grassland is described by the CFA (2014) as follows:

*Grasslands are widespread and cover not only native grasslands, but also areas of cropping pasture and some cultivation. Although trees or shrubs may be present, they are widely spaced, occur only occasionally and form less than 10% canopy cover. Although strictly a shrubland, chenopod shrubland (e.g. Saltbush) is characterised by grass growth after a high-rainfall event. This growth influences fire behaviour in the drier parts of the state and as such, these areas are described as grassland for the purposes of the BMO and AS 3959–2009 in Victoria.*

*The predominant native grasslands in Victoria are located on the volcanic plains in the southwest, the north-central plains, the Wimmera plains, and the Gippsland Plains in the south-east. Clay soils support a diverse range of native grasses, herbs, forbs and small shrubs (<1 metre). The more arid locations exhibit chenopod-dominated shrublands (salt-tolerant, succulent shrubs of various Saltbush species). Montane and alpine grasslands and shrublands are located at higher elevations on fertile, rocky or shallow soils, and dominated by grasses and herbs. within an otherwise treeless landscape.*

*Areas of modified woodland or forest that has been converted to pasture or crop are treated as grassland areas. There may be scattered individual trees or treelines along creeks within an otherwise treeless landscape.*

The CFA (2021) identifies key characteristics of grasslands and grassfires to include:

- *Grassfires can start and spread quickly and are extremely dangerous.*
- *Grassfires can travel up to 25 km per hour and pulse even faster over short distances.*
- *Grass is a fine fuel and burns faster than bush or forests.*
- *Grassfires tend to be less intense and produce fewer embers than bushfires, but still generate enormous amounts of radiant heat.*
- *The taller and drier the grass, the more intensely it will burn.*
- *The shorter the grass, the lower the flame height and the easier the fire will be to control.*
- *Grassfires can start earlier in the day than bushfires, because grass dries out more quickly when temperatures are high.*

### **3.4 Bushfire history**

Bushfire history can be informative to understanding likely bushfire behaviour, but where bushfire has or has not occurred in the past should not be overemphasised in planning decision making. All bushfire hazards are assumed capable of being part of a bushfire (or grassfire) and planning decision making generally responds to bushfire hazards on this basis.

However, bushfire history can assist in understanding how communities have previously experienced bushfire and can reiterate important features likely to arise in any future bushfire.

The potential for bushfire in and around the Study Area is demonstrated by bushfire history in large landscape-scale bushfires arising in the Grampians National Park, some 20kms to the south-west of the Study Area. Many of these fires include grassfires which may be independently ignited or ignited from forest fires in the Grampians National Park.

Closer to the Study Area, several large fires moving through a range of vegetation types, including grassfires, demonstrates the potential for bushfires to arise.

See **Figure 3D: Bushfire history**

### 3.5 Bushfire management strategy guiding public agencies

The *Grampians Bushfire Management Strategy* (DELWP 2020) considers the long-term implications of bushfire to direct the activities of bushfire-related public agencies and to reduce bushfire risk to people, property, infrastructure and economic activity.

The bushfire management strategy contains information that assists in appreciating the landscape bushfire risk. This includes an emphasis on the eastern part of the region (and not Northern Grampians Shire) as where the main 'bushfire risk sits' and that closer to the Study Area, the Grampians National Park is a key driver of bushfires.

The bushfire management strategy includes simulations of house loss to identify areas across a landscape where bushfires could have the greatest impact. The outputs from these simulations show that the Study Area, comparative to other locations in the Loddon Mallee Region, is not especially affected by house loss from large, landscape scale hazards or bushfires. Some local impacts are indicatively shown from smaller areas of hazard closer to the Study Area.

See **Figure 3E: Modelled house loss bushfire risk**

### 3.6 Joint Fuel Management Program

The Joint Fuel Management Program outlines where Forest Fire Management Victoria, the CFA and (sometimes) other public agencies intend to carry out fire management operations on Victoria's public and private land over the next three years. The Joint Fuel Management Program is published by Forest Fire Management Victoria (2021).

The Joint Fuel Management Program can include the following treatments:

- Asset protection zones designed to provide localised protection to human life, property and key assets.
- Bushfire moderation zones designed to reduce the speed and intensity of bushfires.
- Landscape management zones designed to reduce overall bushfire hazard at the landscape scale, in addition to land management and ecological objectives.

The joint fuel management plan identifies interventions to hazard areas. These include landscape moderation zones in hazard areas adjoining the Study Area to the north, and further north-east and east. Asset protection zones are shown around smaller bushland areas within the urban area of Stawell, with corresponding strategic fuel breaks showing non-burning treatments occurring.

See:

**Figure 3F: Joint fuel management plan – Fire Management Zones and Planned Burns**

**Figure 3G: Joint fuel management plan – Strategic Fuel Breaks**

### 3.7 Victorian Fire Risk Register

The Victorian Fire Risk Register (VFRR) is a data set prepared by fire authorities and local councils that identifies assets at risk of bushfire. The human settlement data is most relevant to planning scheme decision making.

The VFRR is useful to the extent that it shows current assets (for example, settlements) at risk, according to fire authorities and the local council. The VFRR should not however be over-emphasised in planning decision making as it has not been prepared for this purpose and does not contemplate new risk that might arise because of a planning decisions.

The VFRR identifies high risk areas comprising the settlement / rural interface on all sides of Stawell. This reflects the risk of bushfires impacting on settlement edges.

An area of VFRR extreme is identified in and around the Rural Living Zone / London Bushland Reserve east of the Study Area. This likely reflects private property within heavily vegetated areas as the driver of the risk. The VFRR of extreme is not especially relevant to the Study Area as it is not currently and will not be heavily vegetation in completed development, along with any bushfire in the extreme area most likely to be moving away from the Study Area under dominant bushfire weather conditions.

See **Figure 3H: Victorian Fire Risk Register human settlement polygons**

### 3.8 Planning scheme bushfire designations

Planning schemes identify potentially bushfire affected land through the inclusion of land into the Bushfire Management Overlay or within a designated Bushfire Prone Area (referenced in *c13.02-1S Bushfire Planning* and approved under the Building Act 1993).

### Bushfire Management Overlay

The Bushfire Management Overlay is applied across Victoria based on areas of non-grassland vegetation larger than 4ha (patch size criteria) with a 150m buffer applied to account for ember attack (ember criteria). It is also applied to land likely to be subject to extreme bushfire behaviour (extreme fire behaviour criteria).

The Bushfire Management Overlay applies to the northern and a small part of the eastern Study Area, as these areas are within the 150m buffer area.

See Figure 3I: Bushfire Management Overlay

### Bushfire Prone Area

The Bushfire prone area requires applies to all land within the Bushfire Management Overlay along with grassland areas, smaller patches of non-grassland vegetation and land usually within 150m or 50m of these areas (forming part of the ember protection buffer).

The Bushfire Prone Area applies to all land in the Study Area. This reflects its current grassland setting, although some emerging urban development close to Sloan Street is removing grassland hazards.

See Figure 3I: Bushfire Prone Area

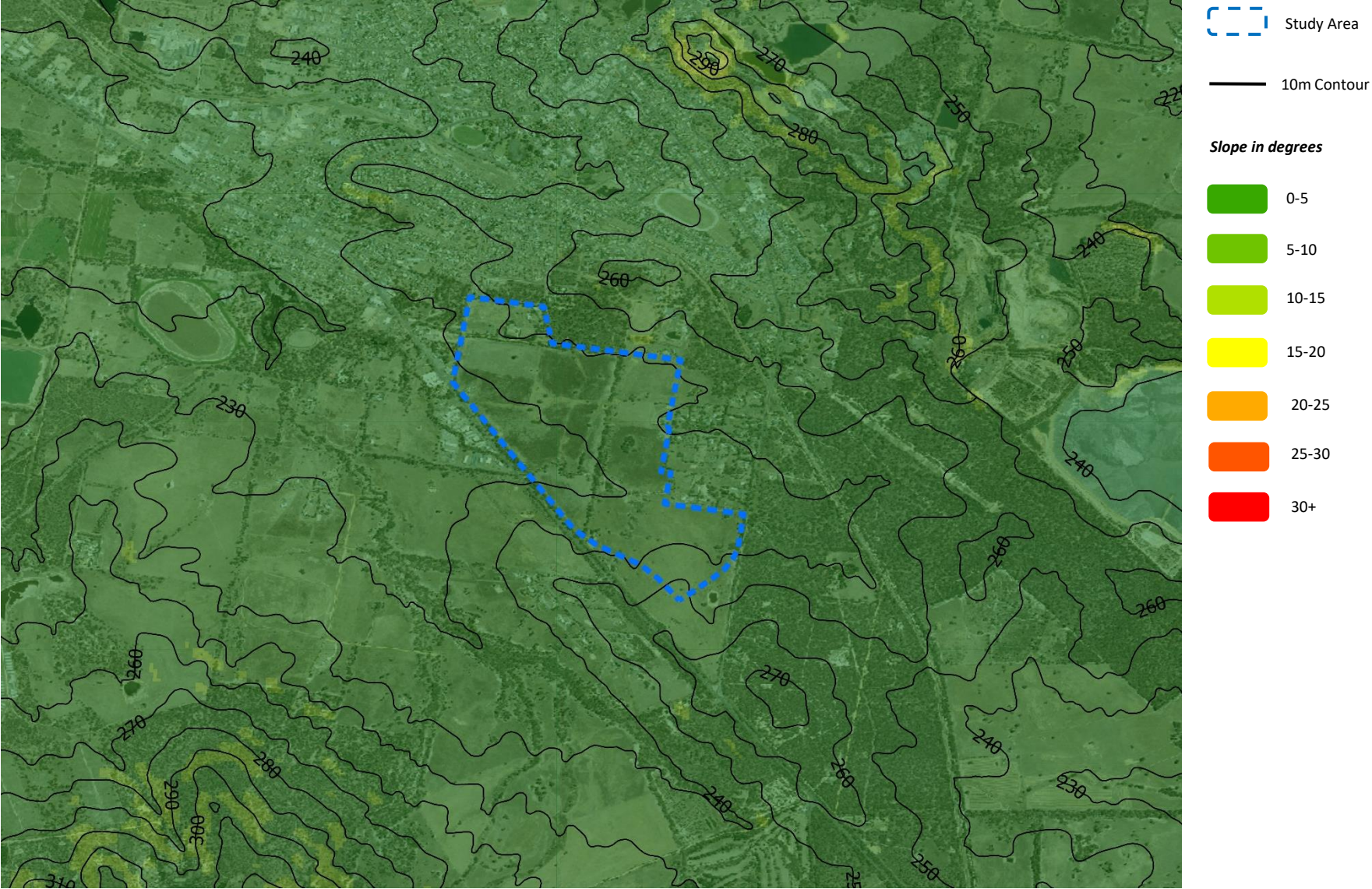
## **3.9 Regional bushfire planning assessment**

The *Regional Bushfire Planning Assessment Grampians Region 2012* (DPCD) provides information about 'identified areas' where a range of land use planning matters intersect with a bushfire hazard.

Identified areas apply to the northern Study Area interface with existing development in Stawell, recognising that currently the Study Area itself is the hazard on the existing settlement interface in this part of Stawell.

See Figure 3J: Regional Bushfire Planning Assessment

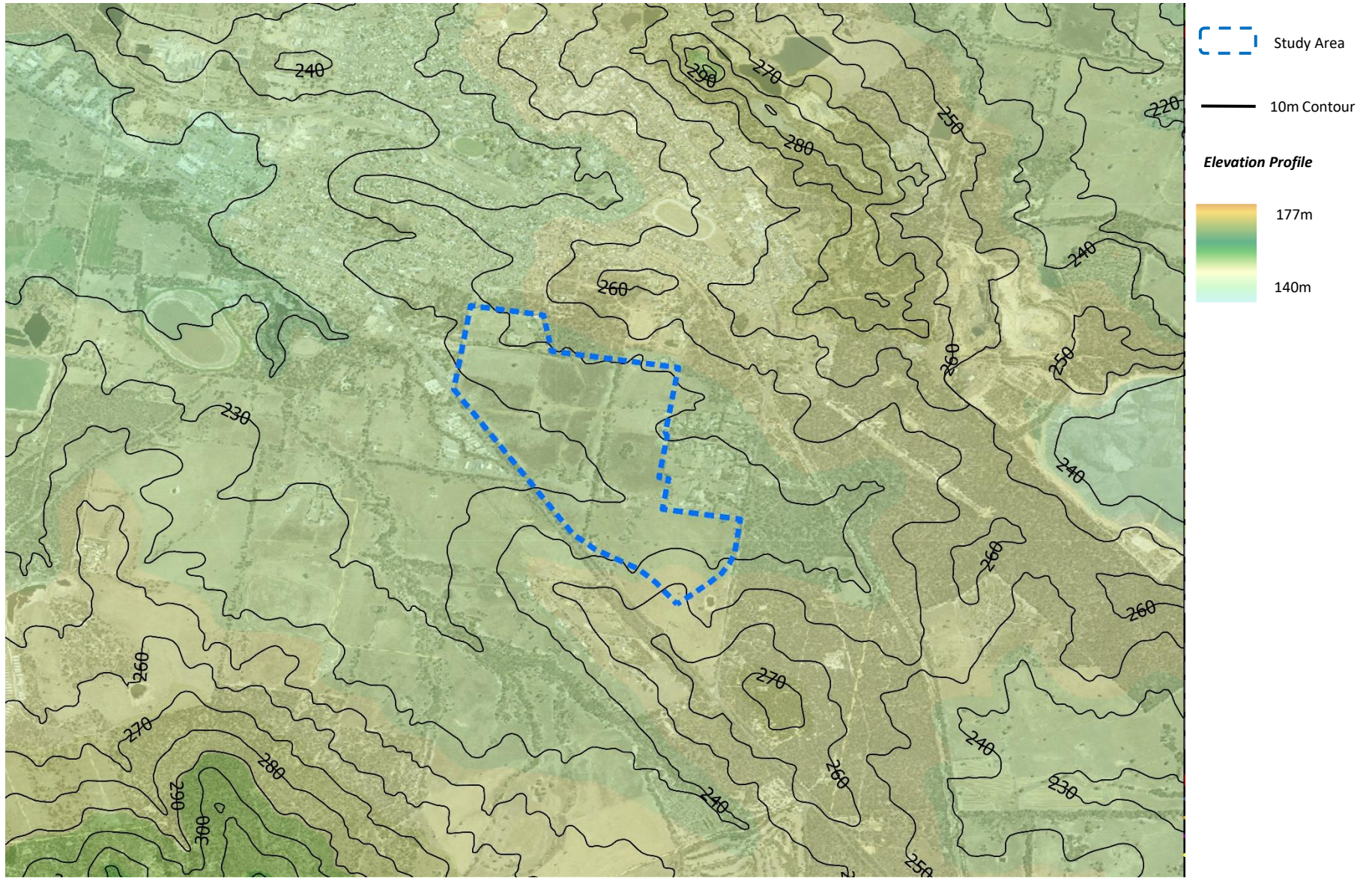
Figure 3A : Slope based on a 10m contour



Date: 6/2/2024

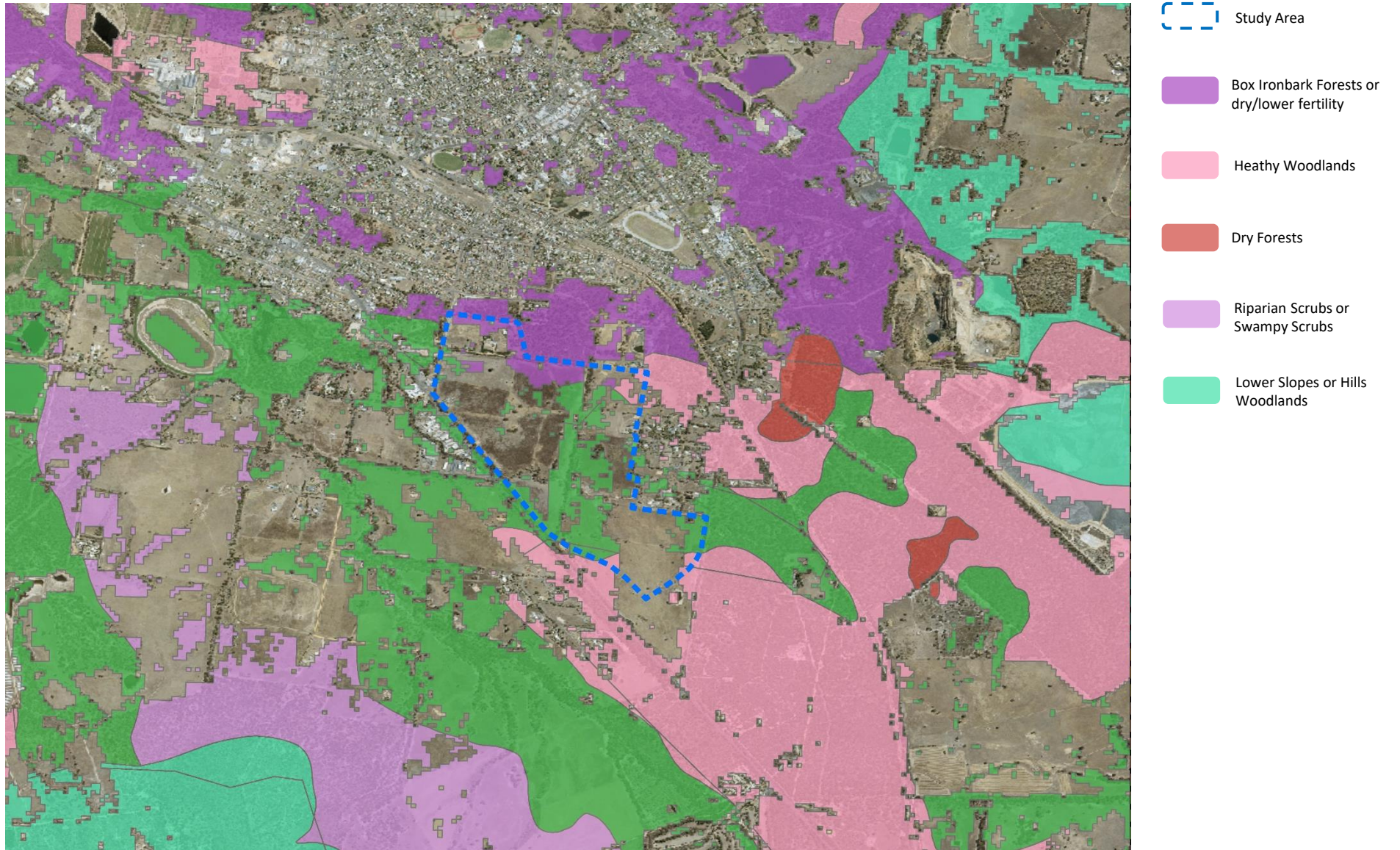


Figure 3B: Elevation based on 10m contour



Date: 6/2/2024

Figure 3C: Ecological Vegetation Classes



Date: 6/2/2024

Figure 3D: Bushfire history

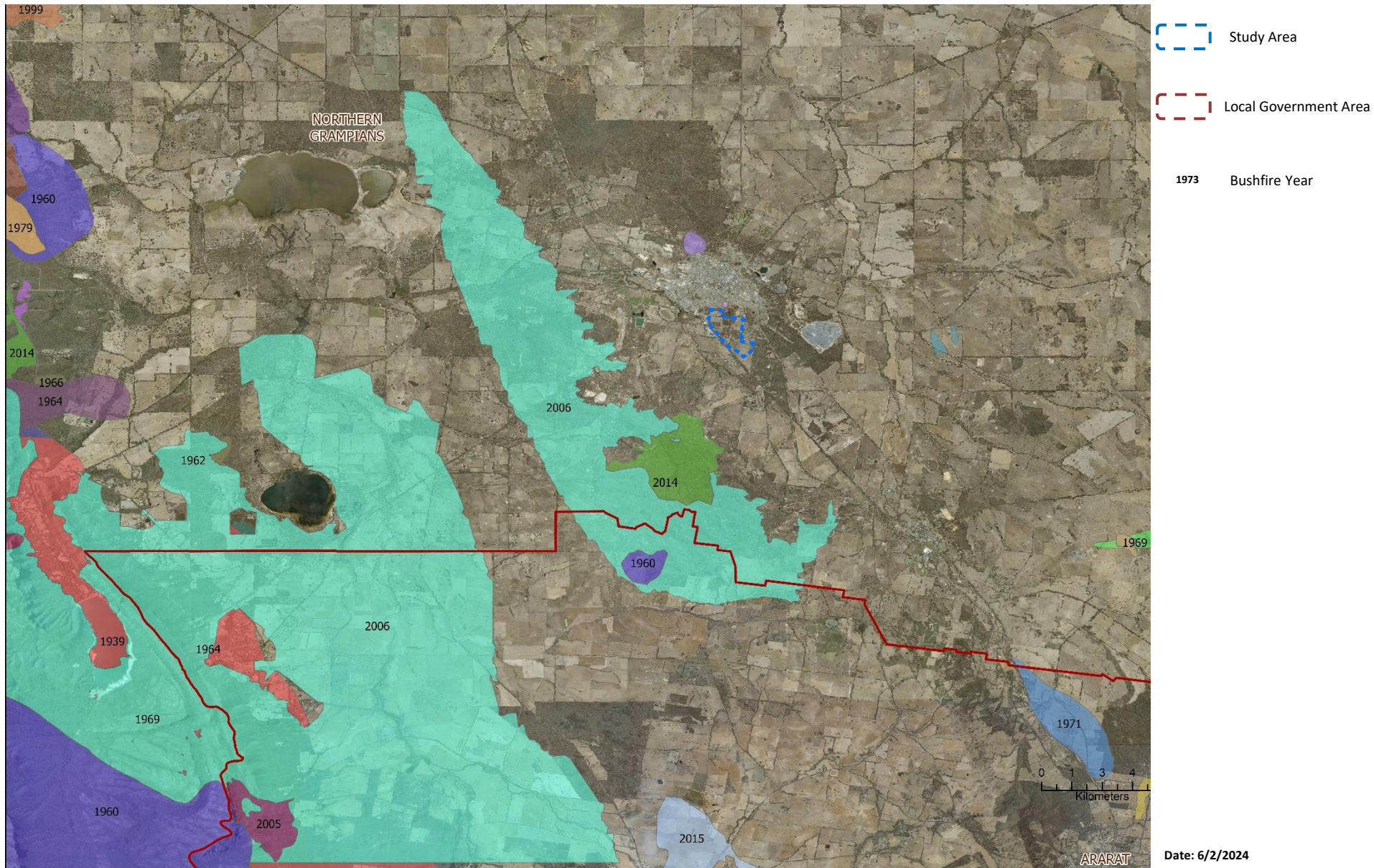


Figure 3E: Modelled house loss bushfire risk (adapted from DELWP 2020)

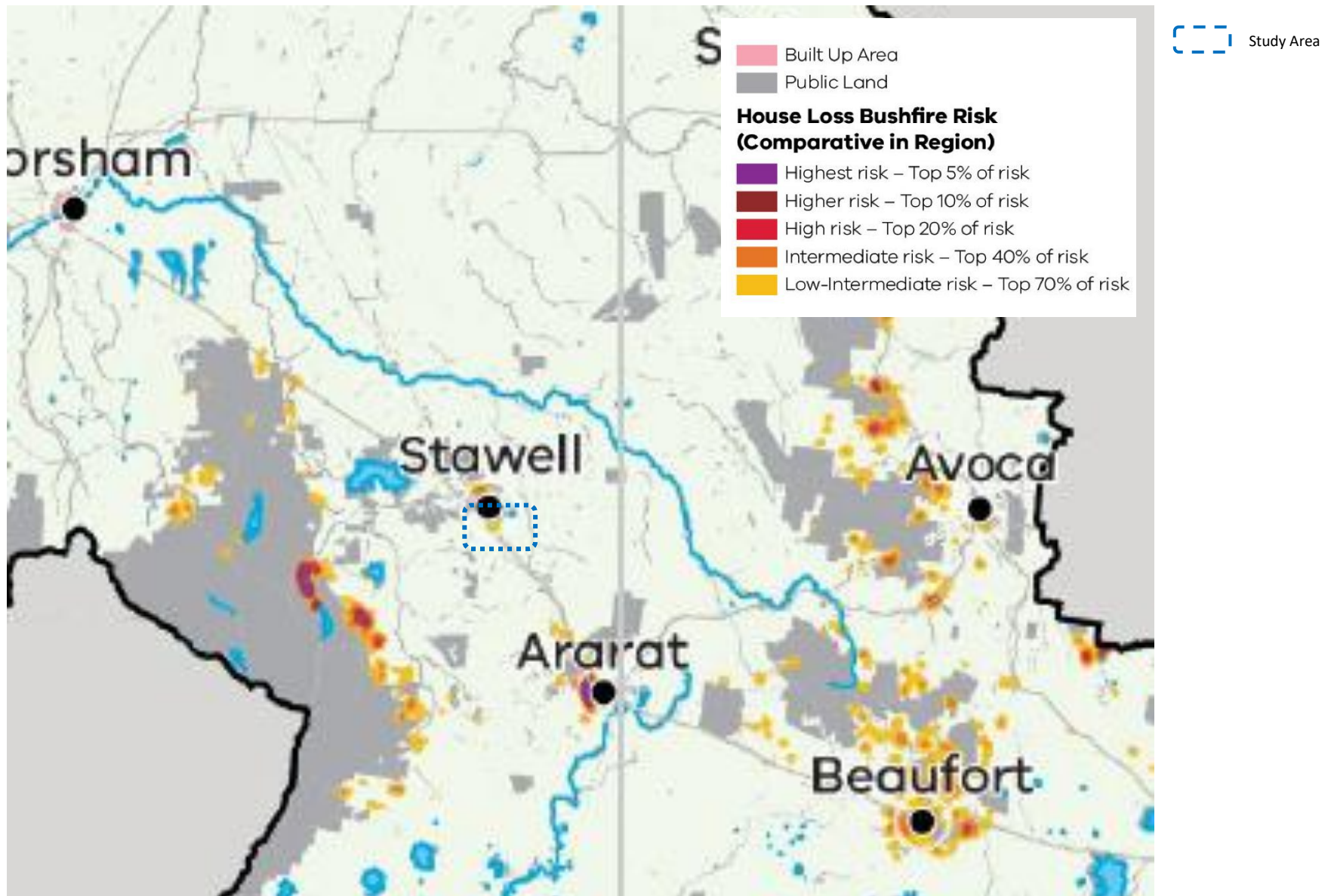


Figure 3F: Joint fuel management plan – Fire Management Zones and Planned Burns

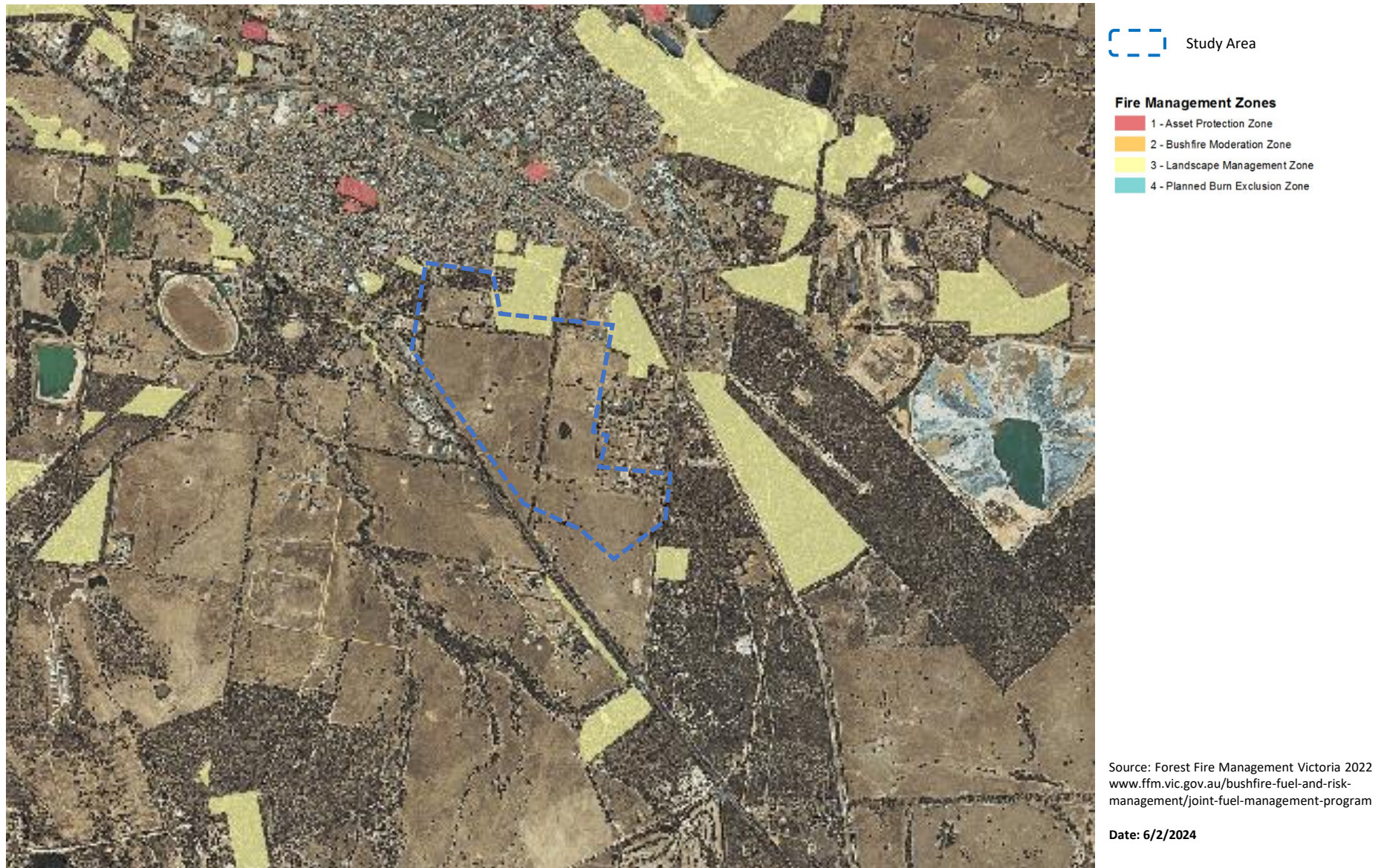


Figure 3G: Joint fuel management plan – Strategic Fuel Breaks

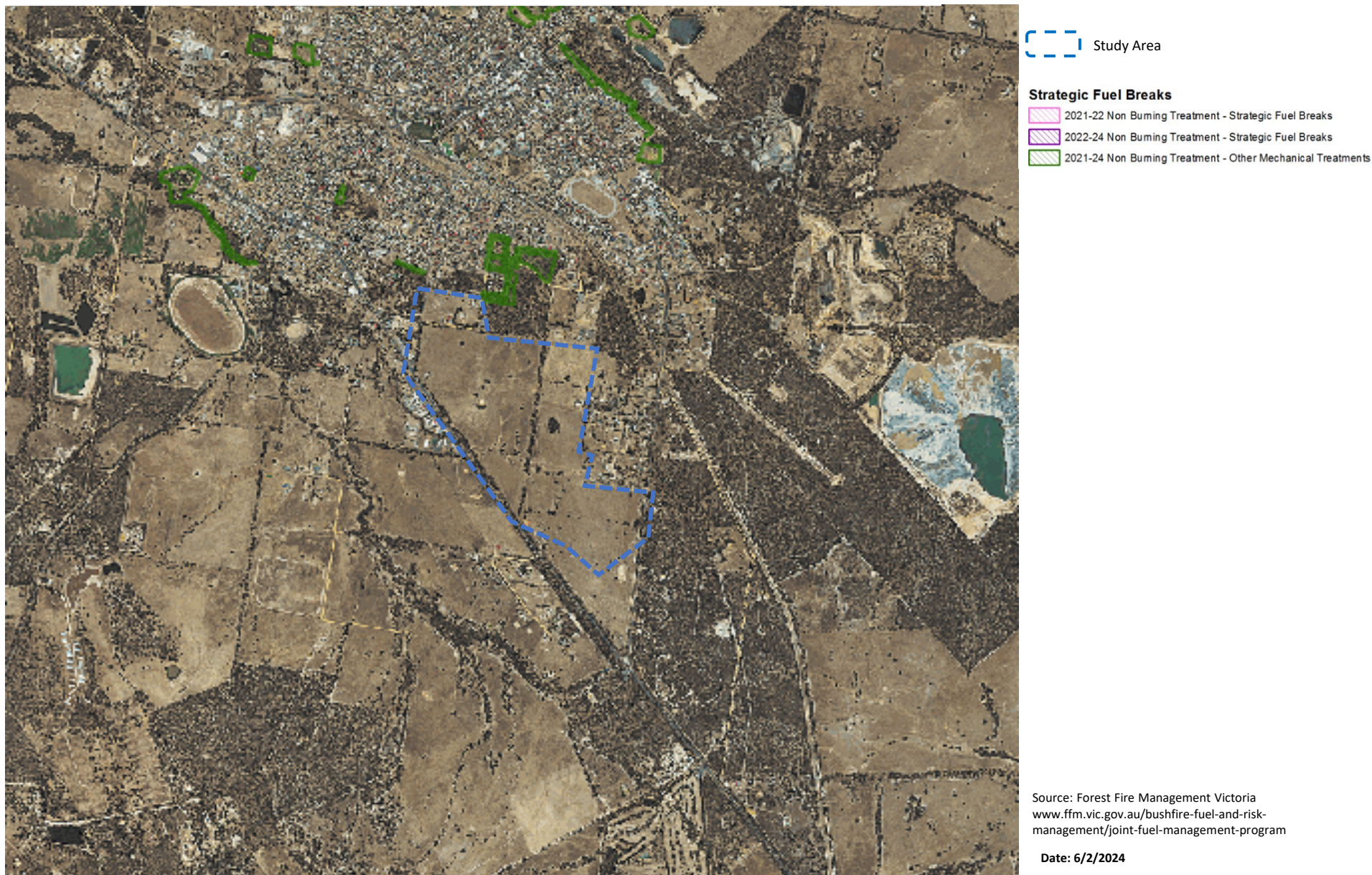


Figure 3H: Victorian Fire Risk Register Human settlement

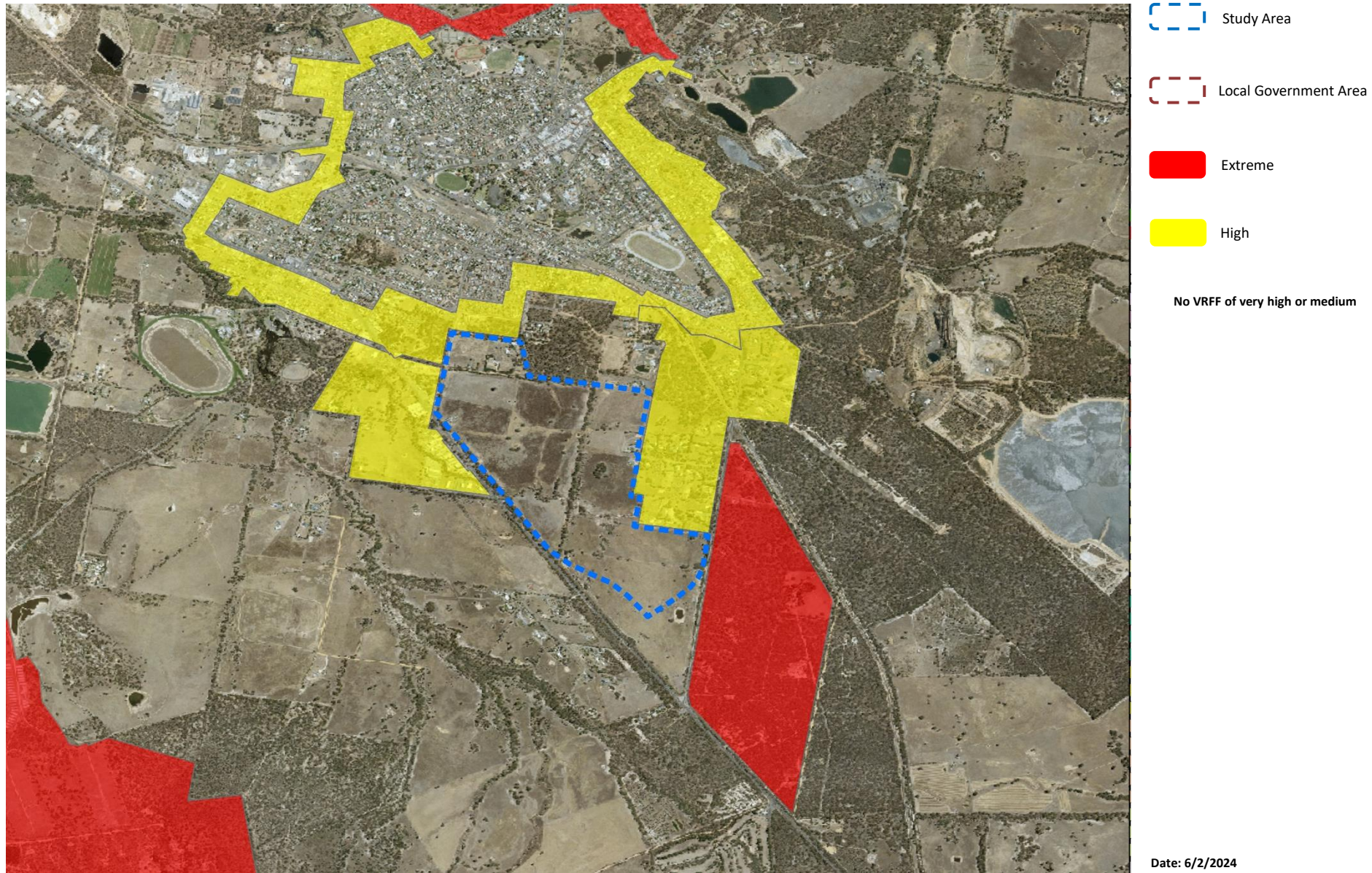


Figure 31: Bushfire Management Overlay and Bushfire Prone Areas

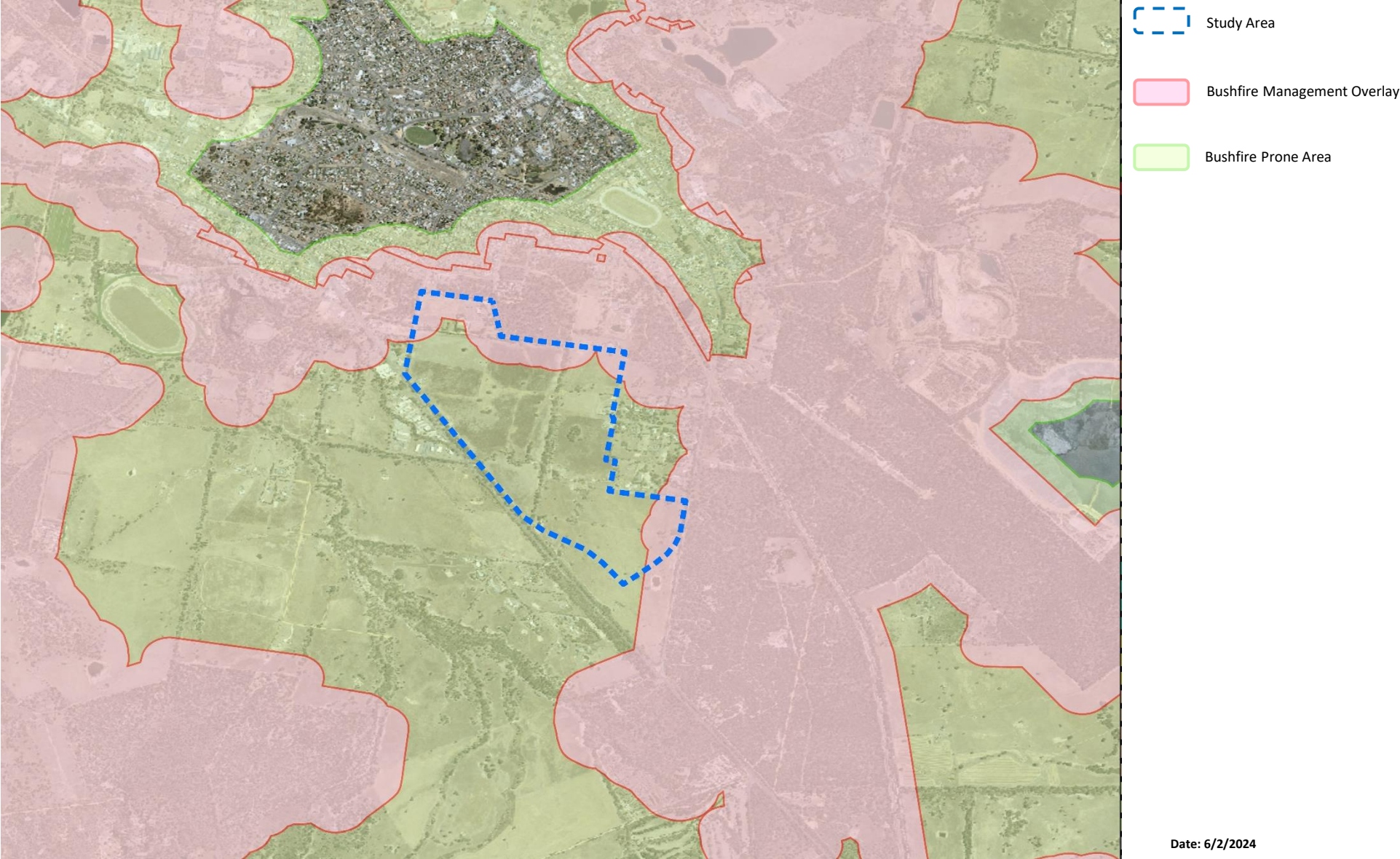
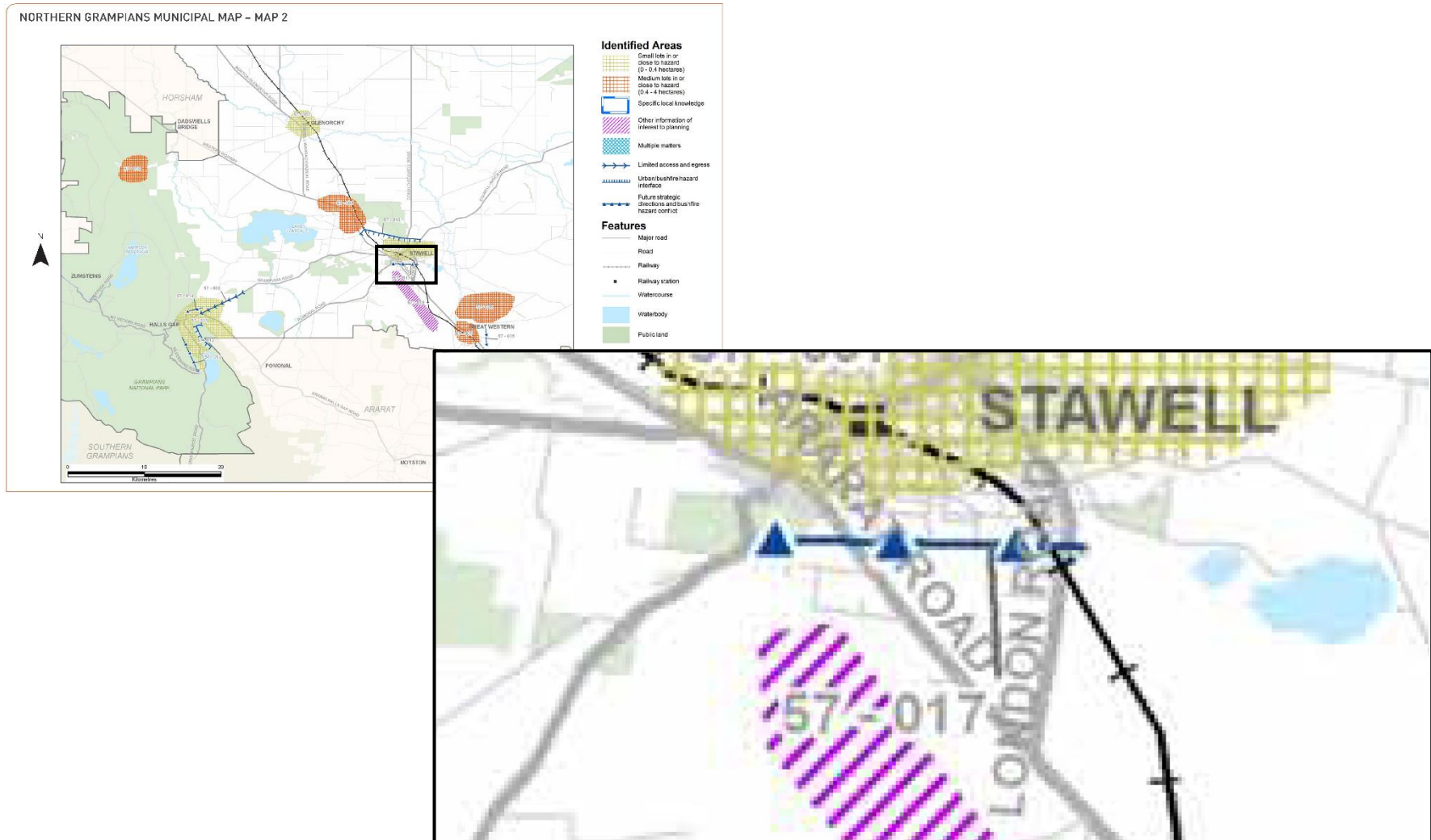




Figure 3J: Regional bushfire planning assessment – Grampians Region



57-016	Stawell	North-western boundary of Stawell interfaces with bushfire hazard area associated with the Deep Lead Flora and Fauna Reserve.
57-017	Stawell	Stawell Strategic Framework Plan provides for future residential development in proximity to a bushfire hazard area and near grasslands that are a known bushfire hazard.

Source: DPCD 2012

## 4. Bushfire hazard landscape assessment

### 4.1 About the bushfire hazard landscape assessment

The bushfire hazard landscape assessment provides information on the bushfire hazard more than 150 metres from a location. Considering bushfire from a landscape perspective is important as it affects the likelihood of a bushfire threatening a location, its likely intensity, destructive power and potential impact on life and property. These characteristics help understand how bushfire may impact on a location.

The bushfire hazard landscape assessment is ordinarily used to respond to the objectives and approved measures in *c53.02-4.1 Bushfire Planning* of the planning scheme when a planning permit is required under *c44.06 Bushfire Management Overlay*. This requires that the risk from the surrounding landscape is mitigated to an acceptable level for development to proceed. The bushfire hazard landscape assessment is then used to consider how site-based safety measures should be applied so that proposed mitigation is responsive to the landscape risk.

However, as this is a strategic project to inform future strategic and settlement planning and potentially planning scheme amendments, the bushfire hazard landscape assessment has been prepared to support a broader understanding of bushfire risk as defined by the planning scheme to inform the *c13.02 Bushfire Planning* assessment contained in this report.

The methodology for a bushfire hazard landscape assessment is set out in [Planning Permit Applications Bushfire Management Overlay Technical Guide 2017 \(DELWP\)](#).

This section describes landscape bushfire hazards. Having regard to the contextual information in Section 3, it considers how the bushfire hazard in the surrounding landscape may affect the Study Area.

Landscape bushfire hazards are important because they help to understand how bushfire may impact on a location, including the likelihood of a bushfire threatening a location, its likely intensity and destructive power, and the potential impact on life and property.

### 4.2 Landscape bushfire hazards

#### Sub-regional landscape bushfire hazards

At a sub-regional scale, the main areas of landscape bushfire hazard are in and around the Grampians National Park. These areas have the type and extent of vegetation as well as slope where large, landscape bushfires arise. This is seen in the bushfire history evidence.

These sub-regional scale hazards are 20kms from the Study Area. Bushfire in the wider sub-region adds a level of complexity to bushfire in large distances around them, including because of ember attack which can ignite fires many kilometres away.

However, the distance and the large grassland area between Stawell and the Grampians National Park mean this sub-regional landscape bushfire hazard is not especially relevant to the Study Area. Where there is a risk of ember ignited grassfires or for more grassfires closer to arise, the risk is not elevated to the extent that hazards closer to the Study Area would not otherwise address.

#### Hazard Area 1 (HA1 on Figure 4B: bushfire hazard landscape assessment diagram)

Hazard area 1 comprises heavily forested areas.

Fire runs in the hazard are up to 6kms long, with the potential for fire to move into them from grassland areas and for fire to move out of them into grassland areas closer to the Study Area. These fire runs are located south-west of the Study Area. Prevailing bushfire weather in Victoria is likely to move a bushfire towards the Study Area.

The hazard area has the potential to enable bushfires to grow large but the lack of rugged terrain, the vegetation type and the extent of vegetation means the hazard area is unlikely to generate extreme fire behaviour. Instead, a relatively predictable steady state moving bushfire is likely.

The hazard area is separated from the subject locality by 1.5kms of grasslands. This separation means the forest fire behaviour cannot impact on the Study Area but rather the main influence is the potential for grassfires igniting from the forested areas (especially in Hazard area 2).

#### Hazard Area 2 (HA2 on Figure 4B: bushfire hazard landscape assessment diagram)

Hazard area 2 comprises grasslands to the south of the Study Area. Short fire runs within the grasslands of about 1-2kms arise, although the actual fire run will be larger as fire moves through different hazard areas.

These fire runs are located south-west of the Study Area. Prevailing bushfire weather in Victoria is likely to move a bushfire towards the Study Area.

Due to the highly modified environment grassland areas are often in a managed setting either because of agricultural activities or managed as part of the gardens associated with rural living and low-density residential development. For considering the landscape risk associated with grassland areas, it is assumed that the grasslands are unmanaged.

The Country Fire Authority (2023) identify the following grassfire characteristics:

- Grassfires can start and spread quickly and are extremely dangerous.
- Grassfires can travel up to 25 km per hour and pulse even faster over short distances.
- Grass is a fine fuel and burns faster than bush or forests.
- Grassfires tend to be less intense and produce fewer embers than bushfires, but still generate enormous amounts of radiant heat.
- The taller and drier the grass, the more intensely it will burn.
- The shorter the grass, the lower the flame height and the easier the fire will be to control.
- Grassfires can start earlier in the day than bushfires, because grass dries out more quickly when temperatures are high.

Interspersed with grassland areas are areas of fragmented vegetation. These will include clumps of non-grassland vegetation, roadside vegetation, strips of trees (for example, along vehicle accesses and water courses) and the occasional smaller patch of non-grassland vegetation. The extent of fragmentation will be a factor when considering bushfire at the local scale but the impact on landscape-scale bushfire is minimal. The grassland vegetation will be the dominant driver of bushfire behaviour in these grassland areas.

The hazard area is separated from the subject locality by the Western Highway. Through ember attack and the areas of hazards on the roadside, fire could jump the road.

Hazard area 2 is the main landscape hazard affecting the Study Area.

Hazard Area 3 (HA3 on Figure 4B: bushfire hazard landscape assessment diagram)

Hazard area 3 comprises heavily forested areas. Fire runs in the hazard of up to 1km are available. These fires runs are located east of the Study Area, an aspect where prevailing bushfire weather in Victoria is likely to move a bushfire away from the Study Area.

The extent of vegetation and lack of terrain means extreme fire behaviour is not likely. Due to this and the favourable aspect, Hazard area 3 is best described as a local and site-scale hazard and not a landscape hazard. It is further assessed later in this report.

#### Other hazard area

Other hazard areas exist to the north-west of Stawell, comprising heavily forested areas. Fire runs in the hazard of up to 8kms are available. These fires runs are located north of Stawell and are separated from the Study area by large areas of low-fuel settlement land. They are not a landscape-scale hazard to the Study Area.

#### **4.3 Likely landscape bushfire scenarios**

The likely bushfire landscape bushfire scenario affecting the Study Area is a grassfire from the south-west. This will be driven in part by the forested areas further away that may create ember ignitions or a bushfire moving from treed areas into grassland areas.

Grassfire may jump the Western Highway through ember attack.

Other hazards, such as hazards to the immediate north and east of the Study Area, are best considered as local and site-scale hazards assessed later in this report.

#### **4.4 Lower fuel areas**

An assessment has been made of areas that may be lower fuel where human life can be better protected from the harmful effects of bushfire. Lower fuel areas can provide protection at a settlement and neighbourhood scale as they provide a form of passive mitigation, enabling people to move away from bushfire hazards if they need to.

*c13.02-1S Bushfire Planning* defines low fuel places as BAL:Low. BAL:Low places are where hazardous vegetation is more than 100m away (50m for grasslands). Hazardous vegetation for the purpose of BAL:Low is defined as vegetation that cannot be excluded under 2.2.3.2 of *Australian Standard AS3959:2018 Construction of buildings in bushfire-prone areas* (Standards Australia).

In BAL:Low places, people sheltering in the open air will not be exposed to flame contact and the highest levels of radiant heat from a moving bushfire, although radiant heat from some hazards may still be life threatening. BAL:Low places may also be subject to localised fires, which could include gardens and structures on fire. BAL:Low places do not consider ember attack, which may arise in these areas.

BAL:Low places are present in the low-fuel urban areas of Stawell, north of the Study Area. Access to these is somewhat complicated by the bushland areas and road side vegetation between the Study Area and low fuel areas. However, on a State, regional or sub-regional basis, the proximity to good.

See **Figure 4C: Low fuel areas and BAL:Low land**

Grassland areas have a credible basis for areas of BAL:Low to arise in conjunction with new development. This is because the separation distances to achieve an area of BAL:Low or an even larger area tend to be highly achievable in grasslands where larger lots exist in combination with a lack of non-grassland vegetation.

#### 4.5 Designated places of shelter

A designated neighbourhood safer place is located at Cato Park in Stawell.

See: **Figure 4B:** Neighbourhood Safer Place locations

Planning scheme considerations around lower fuel areas may often correlate with the location of a designed neighbourhood safer place.

Consistent with CFA advice, designated places of safety are not afforded any weight in this bushfire assessment. This is because designated places of safety are not a justification to enable new risk to be introduced that is otherwise not consistent with planning scheme policies.

#### 4.6 Landscape types

Based on the likely bushfire scenarios, the potential for neighbourhood scale destruction and the availability and access to low fuel areas, landscape types can be applied. The identified landscape types are necessarily strategic and are not intended to be scaled to apply to individual properties. They do however provide an indication on the relative risk in different parts of the bushfire Study Areas based on a neighbourhood scale of assessment.

See: **Figure 4A: Overview of landscape types**

This landscape type levels (1 to 4) are described in *Planning Permit Applications Bushfire Management Overlay Technical*. Generally, as the landscape types identified progress through 1-4, the landscape risk increases.

Landscape type 2 is assessed for the Study Area. Landscape type 2 is described by DELWP (2017) as follows:

- *The type and extent of vegetation located more than 150 metres from the site may result in neighbourhood-scale destruction as it interacts with the bushfire hazard on and close to a site*
- *Bushfire can only approach from one aspect and the site is located in a suburban, township or urban area managed in a minimum fuel condition*
- *Access is readily available to a place that provides shelter from bushfire. This will often be the surrounding developed area.*

The main driver of Landscape type 2 is the presence of bushfire hazards to the south and east, but especially the interaction with grassland areas to the south-west that themselves interact with forested areas in the wider landscape.

In completed development, when grassland is removed and large areas of low-fuel urban land is created, Landscape type 1 would likely arise. Landscape type 1 is described by DELWP (2017) as follows:

- *There is little vegetation beyond 150 metres of the site (except grasslands and low-threat vegetation)*
- *Extreme bushfire behaviour is not possible*
- *The type and extent of vegetation is unlikely to result in neighbourhood scale destruction of property*
- *Immediate access is available to a place that provides shelter from bushfire (usually capable of being provided within a site or development proposal).*

The recommendations later in this report seek to support this outcome.

**Figure 4A: Overview of landscape types**

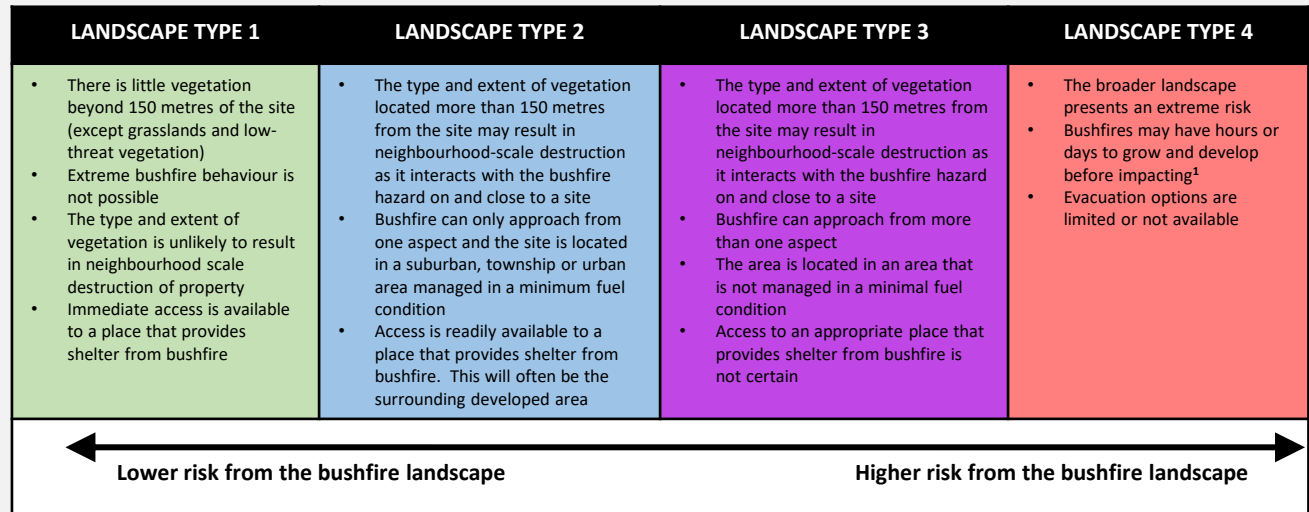
*Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP, 2017) identifies landscape types to inform planning decision making based on the risk from the landscape beyond the site. They enable landscape bushfire information to be described according to a simple framework to assist planning decision making.

Landscape types assist in:

- Consistently describing landscape hazards. Landscape hazards are bushfire hazards more than 150m from an area that inform the likelihood of a bushfire threatening a location and its likely intensity and destructive power.
- Describing proximity and access to low fuel areas that may provide shelter from bushfire. In these areas, people may avoid flame contact and can withstand the effects of radiant heat from a moving bushfire.
- Understanding the relative risk between different locations.

Landscape types when applied provide a spatial representation of how different areas are affected by landscape scale bushfire considerations. Based on this, places that are relatively higher or lower risk emerge.

The diagram on this page summarises landscape types.



**Study Area**

<sup>1</sup> Adapted by author

Figure 4B: Landscape bushfire analysis

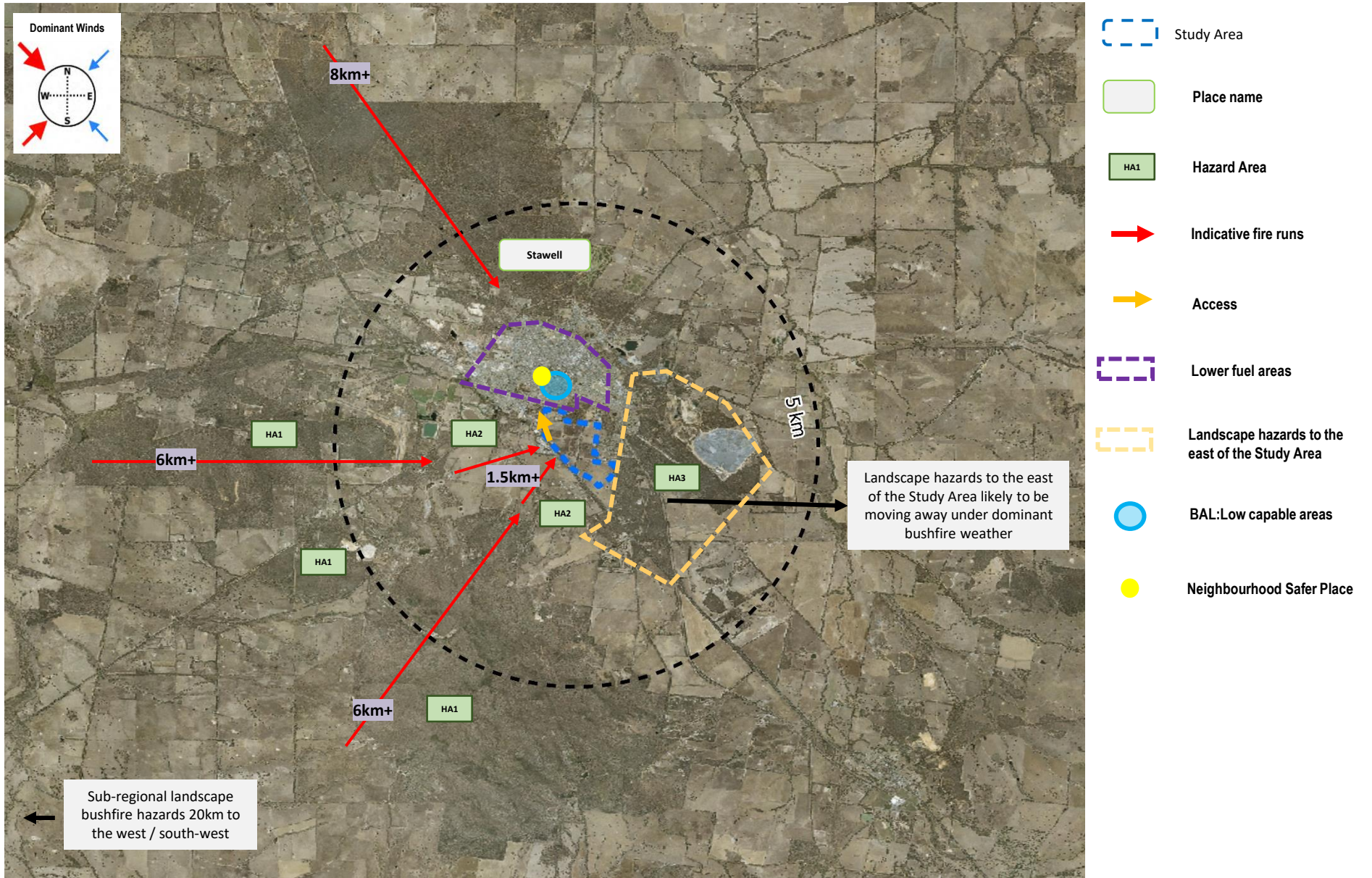
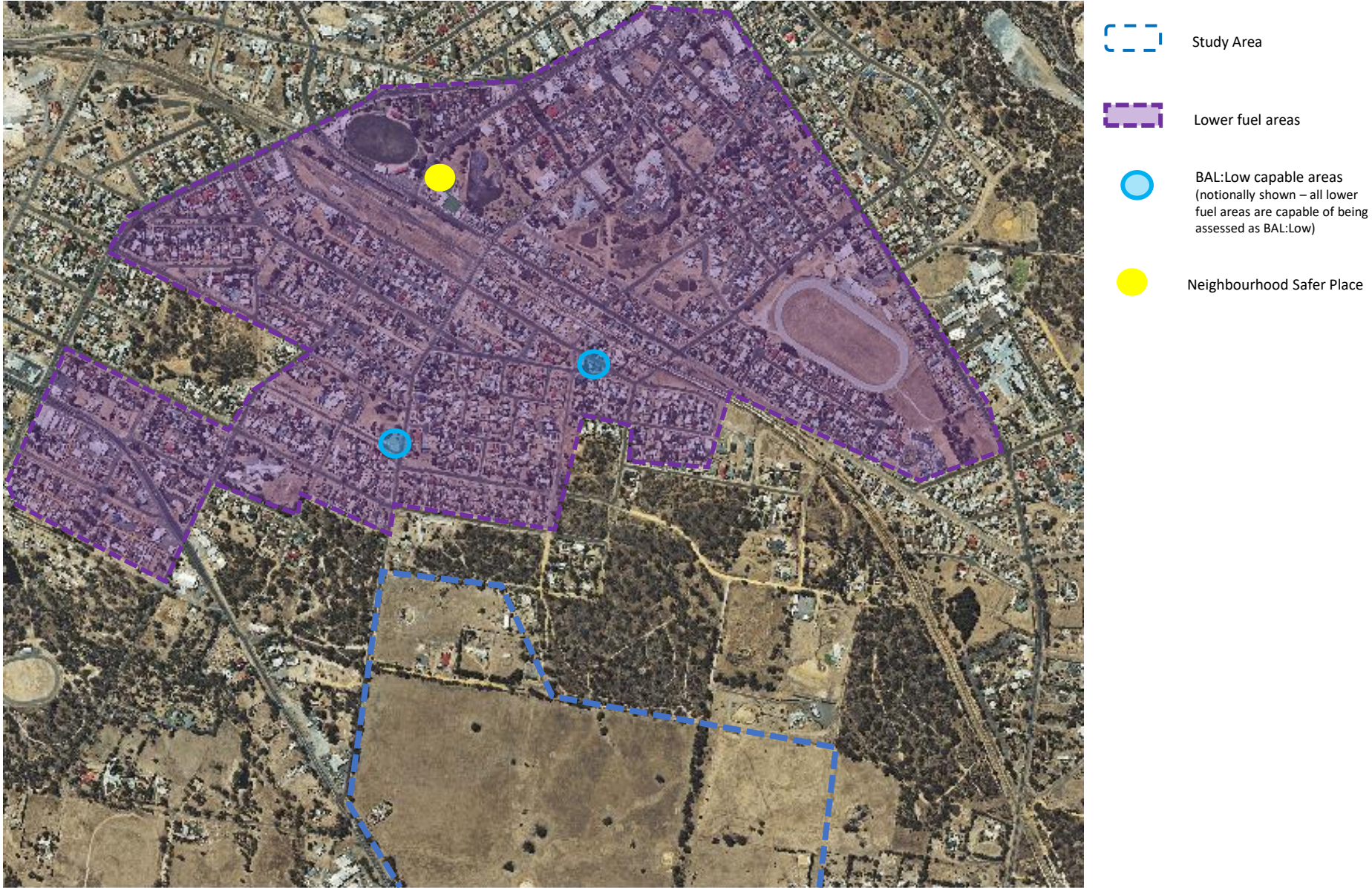


Figure 4C: Lower fuel areas and BAL:Low land



## 5. Exposure to bushfire at the neighbourhood and local scale

Exposure to bushfire at the neighbourhood and local scale assesses the level of radiant heat likely to arise from hazardous vegetation within and in close proximity (150m) to a proposal. Considering exposure to bushfire enables new development to be separated from hazardous vegetation so achieve radiant heat exposure requirements.

This section enables key strategies in *c13.02 Bushfire Planning* to be considered. These strategies include the following:

### Site based exposure

- *Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS3959-2018.*
- *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 AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia).*

### 5.1 Methodology to determine exposure to bushfire

The methodology for a bushfire hazard site assessment as described in *Planning Permit Applications Bushfire Management Overlay Technical Guide* (DELWP 2017) and *AS3959-2018 Construction of buildings in bushfire-prone areas* (Standards Australia) informs the assessment. Key assumptions include a Fire Danger Rating of 100 and a flame temperature of 1080°C.

The hazard assessment is described on the following worksheet and diagram.

See: **Figure 5B: Site assessment diagram**

### Hazard identification

Hazardous vegetation was identified within and around the Study Area using expert judgment based on field work and aerial photography. EVC's and tree cover data sets were also reviewed. Low-threat vegetation as described in *AS3959-2018 Construction of buildings in bushfire-prone areas* (Standards Australia) was excluded as it is not considered hazardous.

Slope under hazardous vegetation was assessed using the 10m contour, having regard to topographical information. Slope under hazardous vegetation informs how fast a bushfire may travel. Where possible, fire runs were based on likely bushfire direction of travel where vegetation was north-west and south-west of the Study Area.

See: **Figure 5A: Bushfire Site assessment diagram (which includes contours)**

### 5.2 Bushfire setbacks

Setbacks from hazardous vegetation were applied based on Column A in Table 2, *c53.02-3 Bushfire Planning*. These setbacks provide for exposure a radiant heat flux of less than 12.5 kilowatts/square metre, as required by *c13.02-1S Bushfire Planning* for a strategic planning document or planning scheme amendment.

See **Figure 5B: Vegetation assessment, applied slope and column setback**

The following is noted:

- Woodland rather than Forest is assessed in the bushland reserves to the north and north-west of the Study Area. These have insufficient canopy cover to justify a Forest assessment at the site-scale. Where canopy cover is above 30% to the east, these are assessed as Forest.
- Vegetation on the Western Highway road reserve adjoining the Study Area is assessed as a localised hazard. It is mostly less than 20m and could be assessed as low-threat / non-hazardous, but the interaction with grasslands further west mean an assessment of a localised hazard triggers a bushfire responsive interface, as recommended later in this report.
- Low density residential areas to the east and north of the Study Area are assessed as grassland. Whilst they were generally well managed at the time of inspection, an assessment of grassland takes a cautious approach as their management may change over time.

Vegetation on the Study Area is assumed to be low-threat in completed development.

However, the draft masterplan shows vegetation corridors and these may be a bushfire hazard, depending on their final vegetation retention and landscape treatment.



The following setbacks arise for hazardous vegetation remaining or added to the Study Area itself:

- Forest – 48m
- Woodland – 33m
- Grassland – 19m
- Localised hazards – 20m

In practice, retained vegetation corridors tend to be mixture of forest, woodland and grassland hazards with the final setback often based on a localised hazard response (i.e. about 20m) rather than a specified setback in c53.02. This also reflects the lack of landscape scale risk arising in these corridors and the reduced potential for a steady state moving bushfire to arise.

### **5.3 Land exposed to a radiant heat flux of less than 12.5kw/sq.m**

Land likely to be exposed to no more than 12.5kw/sq.m of radiant heat emerges from applying the methodology. This land would be exposed to a radiant heat flux of less than 12.5 kilowatts/square metre, as required by *c13.02-1S Bushfire Planning*.

See **Figure 5C: Land likely to be exposed to no more than 12.5kw/sq.m of radiant heat**

Figure 5A: Bushfire hazard site assessment diagram

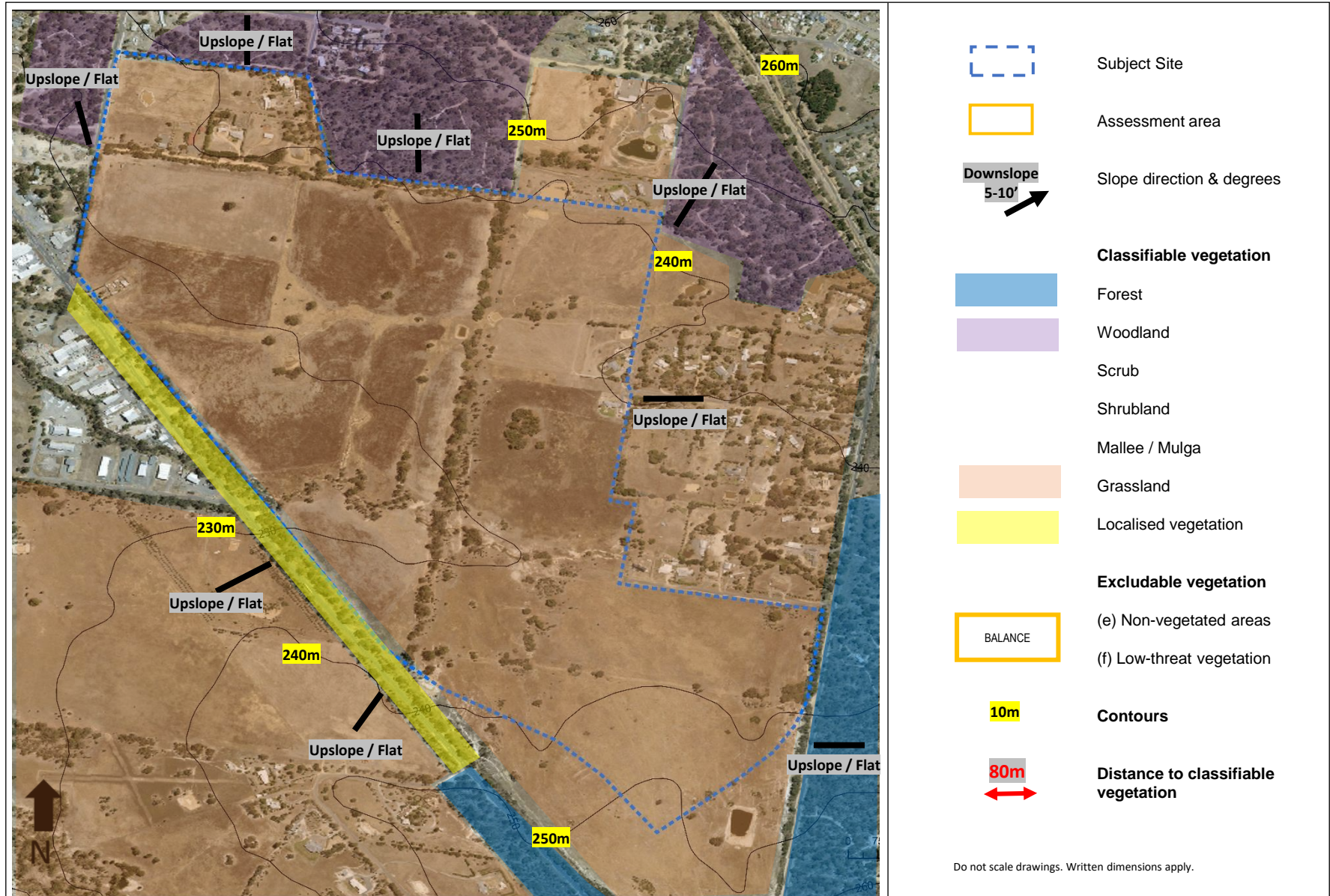


Figure 5B: Vegetation assessment, applied slope and column setback

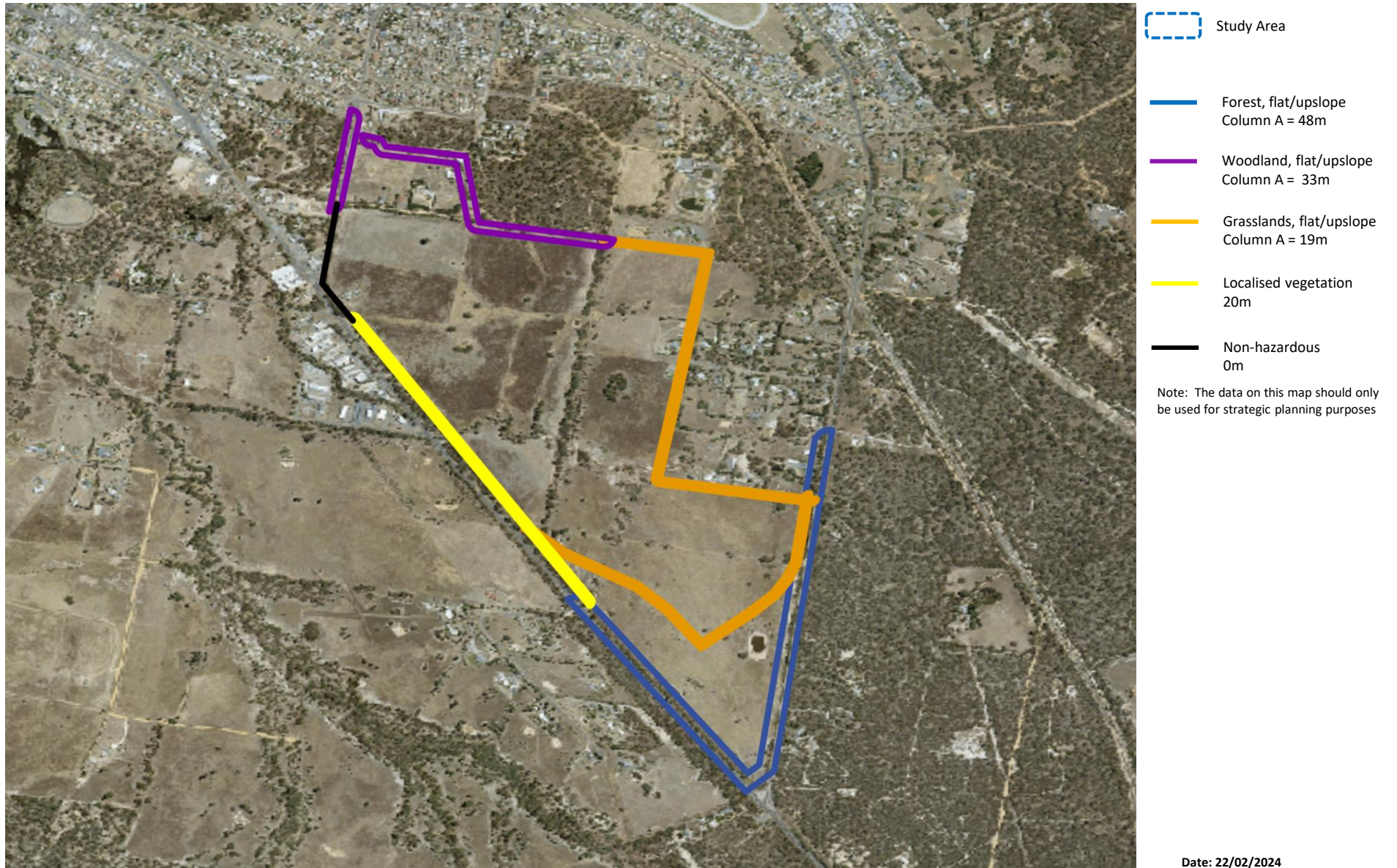
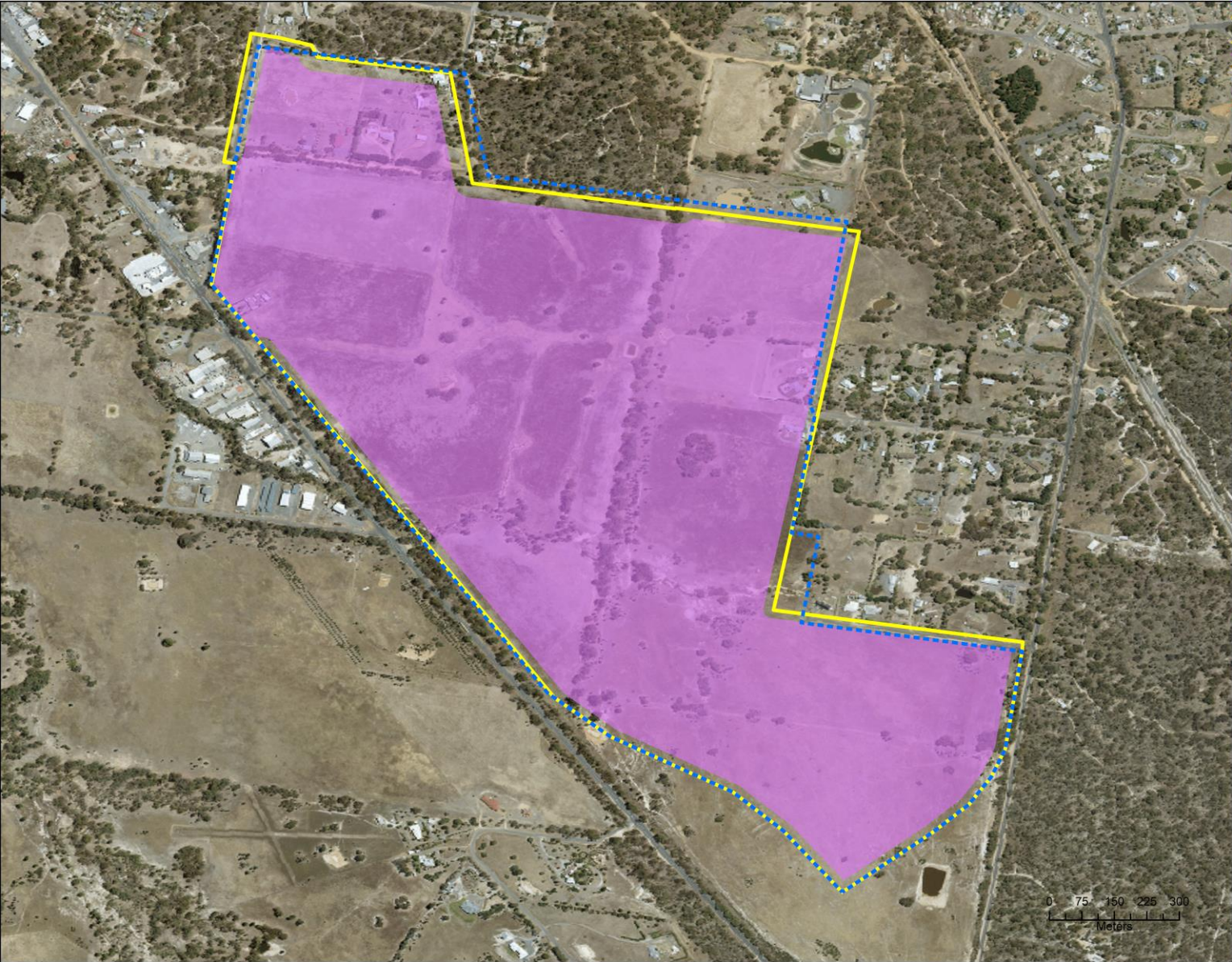





Figure 5C: Land likely to be exposed to no more than 12.5kw/sq.m of radiant heat



-  Study Area
-  Land likely to be exposed to no more than 12.5kw/sq.m of radiant heat
-  12.5kw/sq.m buffer line

Note: The data on this map should only be used for strategic planning purposes

Date: 22/02/2024

## 6. Design responses in bushfire hazard areas

*Design Guidelines: Settlement Planning at the Bushfire Interface (DELWP 2020)* (the ‘Design Guidelines’) provide an appreciation of the bushfire threat and how bushfire may affect a settlement, supported by design advice on settlement planning set out according to three themes:

- Part 1: The form and structure of settlements;
- Part 2: The settlement interface;
- Part 3: Bushfire protection measures across a whole settlement.

The Design Guidelines provide a logical approach to considering good design in settlement planning, supporting many of the objectives and approved measures in *c53.02 Bushfire Planning* and the policy emphasis in *c13.02-15 Bushfire Planning*. The Design Guidelines are not incorporated into the planning scheme.

Using the Design Guidelines now means that any mitigation identified can be counted or relied on as part of the *c13.02-15 Bushfire Planning* assessment in the next Chapter.

### 6.1 Part 1: Form and structure of settlements

#### The bushfire hazard in directing growth

Key design considerations:

- *Settlement planning should direct growth to locations that are less exposed to a bushfire.*
- *Settlement growth should be directed to locations that avoid bushfire risk where possible, including the highest risk aspect(s) where large bushfires will occur.*
- *Settlement growth should also be directed to locations that avoid the most hazardous locations.*
- *Directing new growth to higher risk areas should be carefully considered. Consulting with the relevant fire authority as part of strategic and settlement planning is crucial.*

The landscape risk to the Study Area is from grasslands, as concluded in the bushfire hazard landscape assessment. This is a typical and accepted location for settlement growth in Victoria. The urban development of the Study Area will provide through contemporary development a new settlement interface with bushfire hazards to the south, significantly improving on the current situation for this southern edge to Stawell. A risk reduction overall can be achieved in developing the Study Area.

#### The bushfire hazard in directing growth

Key design considerations:

- *Development that may be occupied by vulnerable people should be located away from the settlement interface and in some locations may not be suitable at all.*

In completed development, low fuel and low risk outcomes will be achieved. Within the context of future residential Zones, there is no concern with vulnerable people being located within the Study Area.

As a residential area, hazardous uses are not envisaged.

#### Lot sizes in settlement layout

The Design Guidelines include discussion on lot sizes in settlements. These are re-produced in full below.

*A key bushfire risk to many settlements is from ember attack. Ember attack may ignite fuel sources and create many smaller fires throughout the settlement. Lot sizes are an important mechanism to support the management of fires ignited from ember attack. Different lot sizes support different bushfire outcomes.*

#### *Residential lots*

*Smaller urban lots, for example less than 800sq.m in size, are less likely to enable fuel sources (including vegetation) due to the limited area of open space. They contribute positively to achieving lower-fuel settlements. However, smaller lots result in structures closer to together, increasing the risk of structure to structure fire.*

*Larger lots, for example 0.2ha- 4ha in size, have the capacity for more localised fuel sources (particularly vegetation) due to more extensive open space areas. They require more extensive management by individual landowners. They also tend not be large enough for landowners to have specialised equipment (for example, tractors) that would make management more practical. Houses, however, are separated further apart minimising the risk of structure to structure fire.*

*An optimum lot size of between 800sq.m-1,200sq.m provides a good balance. This minimises available open space for fuel sources while enabling a good separation between individual structures (ideally more than 10m).*

*Many parts of Victoria encourage the provision of low-density and rural living lots of 0.2ha and above. They are often justified in locations that do not have reticulated services or as a transitional land use from rural to urban (for example, on the edges of settlements).*

*These style of lots present a unique bushfire risk as they have not historically resulted in a well-planned settlement interface or an edge to the bushfire hazard. Bushfires and grassfires can penetrate larger lots and create bushfire pathways into denser residential areas. This can include a moving bushfire front entering a settlement. They may also make it more difficult for firefighting (for example, for the setting up of containment lines) and for the monitoring and enforcement of vegetation management on private land.*

*Where lots larger than 800sq.m - 1,200sq.m are provided, the guidance in this document should be fully considered, especially Part 2: Designing the settlement interface. This will ensure a well-planned settlement interface is created along with an edge to the bushfire hazard.*

The Stawell Structure Plan and the emerging masterplan envisage standard residential / urban lots no greater than 1,200sq.m for most of the Study Area. This is consistent with low(er) fuel outcomes and passive bushfire resilience.

The south-east part of the Study Area (south of Mossman Road) has an emphasis in the Stawell Structure Plan as a possible lower density residential area. This area is especially proximate to bushfire hazards and without treatments, may result in hazardous vegetation remaining on the land. To prevent bushfire hazards arising, bushfire vegetation management should be required on all lots larger than 1,200sq.m if they have an interface to bushfire hazards on adjoining land.

Hazard management on lots larger than 1,200sq.m is a recommendation of this report.

#### Vegetated areas within a settlement (such as parks, nature reserves and river corridors)

Key design considerations:

- *Vegetated areas can be managed so that fuels are consistent with the vegetation management requirements for bushfire. This involves either removing fuels or ensuring fuels are not introduced as part of settlement planning.*
- *Areas that will not be managed for bushfire purposes effectively have their own interface with the bushfire hazard and would require setbacks and vegetation management approaches.*

The draft masterplan shows vegetation corridors and these may be a bushfire hazard, depending on their final vegetation retention and landscape treatment. Subject to further analysis, where they are a bushfire hazard they will require perimeter roads on all sides and must achieve bushfire setbacks.

Based on the typology of vegetation corridors, it is considered that these corridors can be considered localised bushfire hazards with a 20m setback applied. In practice, this enables the perimeter road and a typical Res-code setback within a lot to make up the required the setback.

Effectively managing vegetation within the Study Area is a recommendation of this report.

## **6.2 Part 2: The settlement interface**

### 6.2.1: Apply the required development setback

Key design considerations:

- *New development should be set back from the bushfire hazards. The setback is determined based on the type of vegetation and slope under the vegetation.*
- *Permanently occupied development, such as dwellings, are not permitted in the setback area.*

The development of the Study Area requires a strategic plan to be adopted and a planning scheme amendment. *c13.02-1S Bushfire Planning* specifies that a maximum exposure of 12.5kw/sq.m should be achieved. This is given effect to through the bushfire hazard site assessment and the setbacks derived from it (see Chapter 5).

Meeting the required bushfire setbacks is a recommendation of this report.

### 6.2.2: Design the settlement interface

Key design considerations:

- *Vegetation in the setback area needs to be managed to prevent a moving bushfire front entering the settlement.*
- *Perimeter roads are the preferred design outcome on the settlement interface where a site abuts or is near a bushfire hazard. A perimeter road:*
  - *Enables a no fuel area to form part or all of the interface.*
  - *Enables development to front the bushfire hazard, orienting the rear of lots away from it. The rear of lots is often where introduced fuels create a localised bushfire hazard.*

- *Provides an effective location from which fire authorities can establish positions to attack a bushfire and for land managers to undertake fuel management activities.*

Perimeter roads should be provided on all interfaces with bushfire hazards around the Study Area and adjoining any hazards remaining on the Study Area. Existing roads can function as perimeter roads but development needs to ‘front’ the road and not back onto it. Where direct access to an existing road is not possible, a service road would be required.

Land adjoining the existing low density residential area to the north-east of the Study Area (Mossman Road, Holloway Road East) could be argued as not needing a perimeter road as once development occurs on the Study Area, its risk reduces significantly (as grassfires will no longer be able to approach from the south and west). However, the emerging masterplan shows the unmade road reserve to the west is envisaged to be constructed and Mossman Road to the south is already in place. It is therefore capable of having a perimeter road to development on the Study Area.

It is noted that perimeter roads are also required between hazards and any low-density residential lots proposed within the Study Area.

Vegetation management is not necessary at the immediate hazard interface where standard residential lots adjoin hazards, as the setback combined with the lot size can manage bushfire risk. Vegetation management for bushfire purposes should however be applied to lots larger than 1,200sq.m as these have sufficient land where bushfire hazards may arise.

Interface treatments are a recommendation of this report.

See: **Figure 6B: Hazard interface treatments**

### 6.2.3: Design access and egress

Key design considerations:

- *Ensure people living close to the settlement interface can move away from hazards to a place of relative safety.*

The Study Area is sufficiently large where low fuel areas will arise in completed development. There will be no need for people to leave the Study Area.

Movement within the Study Area is enabled by a dense road network as reasonably anticipated in typical urban development under planning scheme requirements. Multiple roads away from hazard interfaces towards the centre of the Study Area can be enabled.

## **6.3 Part 3: Bushfire protection measures across a whole settlement**

### 6.3.1: Vegetation management

Key design considerations:

- *Ensure vegetation is managed across a settlement where there is exposure to ember attack. Proper vegetation management will help reduce the potential for localised fires from ember ignition.*

The bushfire hazard landscape assessment did not assess a heightened risk of ember attack from landscape-scale hazards. In response to grasslands and other hazards on and close to the Study Area, vegetation management can be achieved through a combination of smaller urban lots and where lots larger than 1,200sq.m are proposed, bushfire vegetation management requirements being applied.

Effectively managing vegetation within the Study Area is a recommendation of this report.

### 6.3.2: Building construction standards

Key design considerations:

- *Consider at the settlement scale how bushfire construction standards are to be applied, including where enhanced protection from ember ignited localised fires and smaller lot sizes are proposed to protect against structure to structure fires.*

The recommendations in this report give effect to the *c13.02-1S Bushfire Planning* requirement than development achieve radiant heat exposure requiring no more than a BAL12.5 construction standard.

The bushfire hazard landscape assessment did not assess a heightened risk of ember attack from landscape-scale hazards. The typology of residential development in a growth area does not indicate a need to factor in any enhanced resilience from structure-to-structure fires. The design of the proposal intends to prevent bushfire penetrating development areas.

### 6.3.3: Fences and other localised fuel sources

Key design considerations:

- *Designing and planting for bushfire can help manage fuels being introduced around buildings.*
- *Fences can be a key source of fuels within settlements.*

The typology of standard lot sizes does not indicate a need to manage fencing. However, where lots larger than 1,200sq.m are proposed, non-combustible fencing should be required given the potential for these larger lots to carry more bushfire hazards.

Managing fencing on larger lots is a recommendation of this report.



**Figure 6A: Understanding the bushfire threat** (extract from *Design Guidelines: Settlement Planning at the Bushfire Interface* (DELWP 2020))

## Understanding the bushfire threat

### Landscape scale bushfire threats

Vegetation, topography and weather conditions are the three major characteristics that contribute to landscape scale bushfire threat.

The intensity and duration of a bushfire is largely influenced by these factors. These broader landscape characteristics strongly impact how a fire is likely to act and its probable size, intensity and destructive power and therefore its level of risk and potential to impact people and safety. In some circumstances the risk from a large bushfire cannot be mitigated, which is why development should be avoided in the areas of highest risk.

### How bushfire may threaten a settlement

Bushfires are complex and many factors contribute to their behaviour and the threat they can pose. For the purpose of addressing bushfire through the planning scheme, there are three main factors to be considered at the settlement scale.

1. Flame contact and radiant heat
2. Ember Attack
3. Bushfire 'fuels' in vegetated areas

### 1. Flame contact and radiant heat

The settlement interface with the bushfire hazard is where a moving bushfire front will create flame contact and radiant heat that are harmful to human life and likely to destroy buildings.

Part 2 of the Guidelines provides direction on how to design the settlement interface to mitigate the impact of flame contact and radiant heat from a moving fire front.

### 2. Ember attack

Land on the settlement interface and land throughout a settlement may be exposed to ember attack.

Ember attack occurs when small burning twigs, leaves and bark are carried by the wind, landing throughout a settlement and igniting fuel sources. Fuel sources typically include vegetation but can also include buildings and sheds.

When ignited from embers, these fuel sources can generate flame contact and levels of radiant heat that are harmful to human life and can destroy buildings. Ember attack is the most common way that structures catch fire during a bushfire. Refer to Parts 1 & 3 on how to manage the threat from ember attack within a settlement.

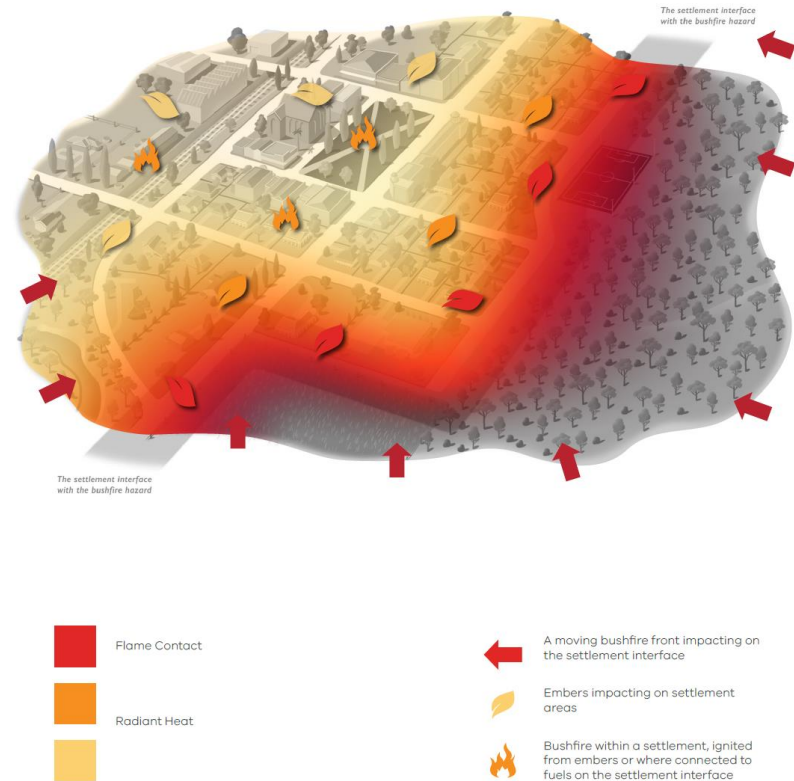
### 3. Bushfire 'fuels' in vegetated areas

'Fire runs' is the term given to describe how a bushfire will likely 'run' or move through a landscape. Fire runs are fuelled by vegetation and can be ignited where there is a continuous fuel path. This path may be from a forest and lead to a settlement. If the fuels at the interface are not managed it enables deeper penetration of a moving fire front or ember attack potential.

Vegetated areas within a settlement, such as nature reserves, river corridors and areas of remnant vegetation, can create a larger fire run by creating a continuous fuel path within or through a settlement.

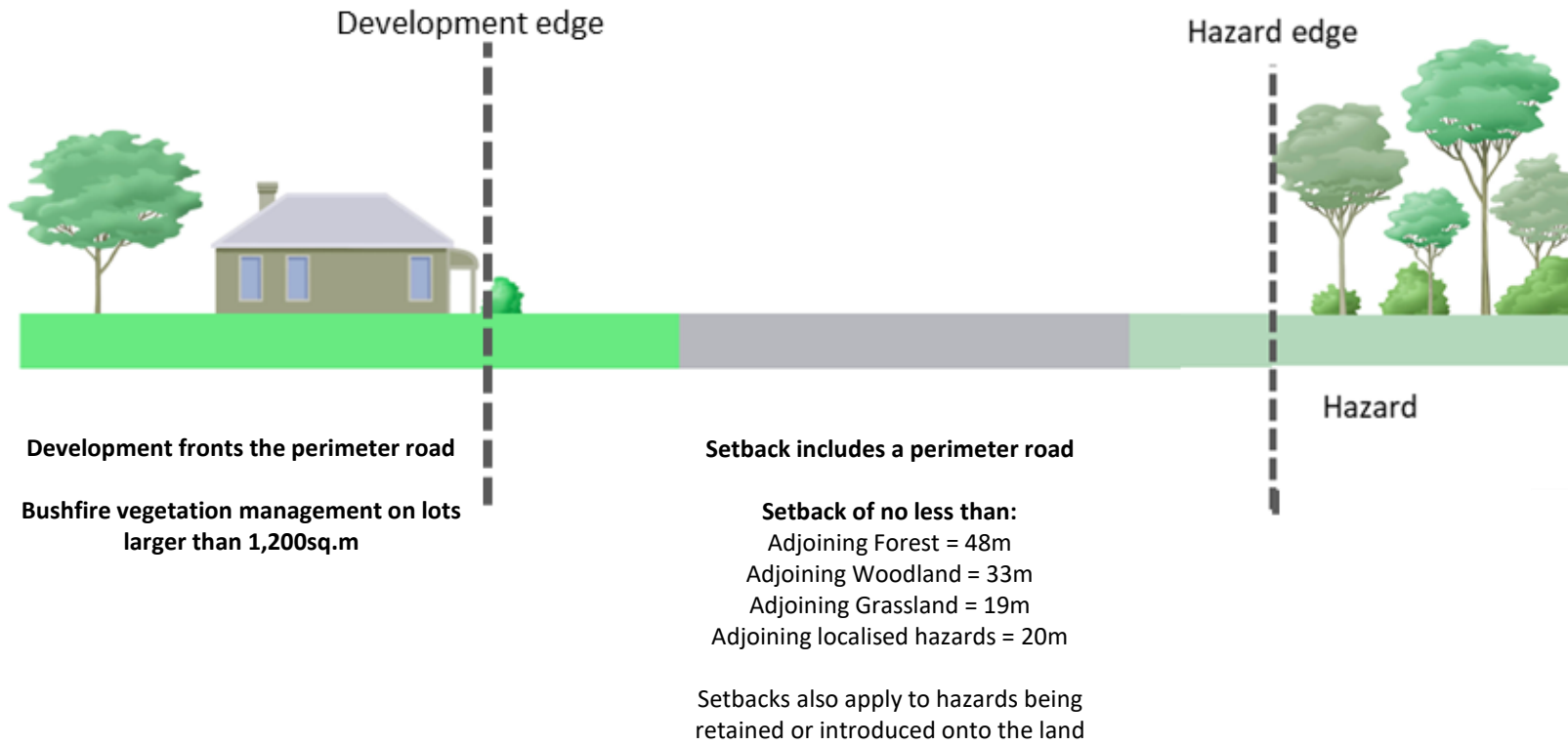
Therefore, large vegetated areas may contribute to the fire run potential and therefore the risk to human life.

Refer to 1.4, 2.2, 3.1 and Attachment 1 on how to manage the threat from vegetated areas within a settlement.



**Figure 2: How bushfire may threaten a settlement**

Figure 6B: Hazard interface treatments



## 7. Assessment against *c13.02-1S Bushfire Planning* and other bushfire provisions

This report has considered the bushfire context of the Study Area, the landscape hazard, the availability of low fuel areas and whether there are locations that could satisfy the *c13.02 Bushfire Planning* exposure requirement. It has also considered design response for bushfire.

This chapter assesses the Study Area against planning scheme requirements.

### 7.1 *c13.02-1S Bushfire Planning*

#### 7.1.1 Landscape bushfire considerations

*c13.02-1S Bushfire Planning* requires a tiered approach to assessing the hazard:

- *Considering and assessing the bushfire hazard on the basis of [...] landscape conditions - meaning the conditions in the landscape within 20 kilometres and potentially up to 75 kilometres from a site.*
- *Assessing and addressing the bushfire hazard posed to the settlement and the likely bushfire behaviour it will produce at a landscape, settlement, local, neighbourhood and site scale, including the potential for neighbourhood-scale destruction.*

The bushfire hazard landscape assessment has considered the bushfire hazard at the strategic and landscape scales as required by these policies.

The residual risk at the landscape scale is from grassfire. Mitigating the landscape impact of grassfire is highly achievable through the separation of development from unmanaged grassland areas and the planning of development to be low-fuel, preventing grassfire from penetrating the urban area and providing the ability for people to move away from the hazard interface. These outcomes are highly achievable.

The identified landscape type was Landscape type 2, which positions the Study Area at the lower end of bushfire risk in Victoria. Due to the lack of non-grassland landscape scale hazards, the potential for extreme bushfire behaviour is limited.

In completed development in the Study Area, Landscape type 1 will be readily assessed as grassland hazards on the land would have been removed and low fuel areas will have emerged.

Based on the landscape assessment undertaken, it is concluded that the urban development of the Study Area is consistent with landscape-scale bushfire considerations.

#### 7.1.2 Alternative locations for development

*c13.02-1S Bushfire Planning* includes two strategies that seek to direct new development:

- *Give priority to the protection of human life by [...] directing population growth and development to low risk locations[.]*
- *Assessing alternative low risk locations for settlement growth on a regional, municipal, settlement, local and neighbourhood basis.*

The landscape scale risk is low to moderate, positioning the subject site at the lower end of bushfire risk in Victoria. The site scale risk is also low-to moderate, with areas to be made available within completed development on the Study Area for people to move away from hazard edges where a bushfire would impact.

There is good access to locations outside of the proposal where human life can be better protected from a bushfire, if evacuation was ever required. These characteristics make the subject site a good location to direct development through planning decision making.

The bushfire risk at the site scale is low to moderate based on the exposure benchmarks in planning schemes. There is no site-scale bushfire feature or risk that impacts on the use of the subject site for sand extraction.

The Study Area is a credibly argued preferred location for growth.

#### 7.1.3 Availability of safe areas

*c13.02-1S Bushfire Planning* requires a location in easy reach that provides absolute protection for life from the harmful effects of bushfire:

- *Ensuring the availability of, and safe access to, areas assessed as a BAL-LOW rating under AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia) where human life can be better protected from the effects of bushfire.*
- *Directing population growth and development to low risk locations and ensuring the availability of, and safe access to, areas where human life can be better protected from the effects of bushfire.*

BAL:Low places are present in the low-fuel urban areas of Stawell, north of the Study Area. Access to these is somewhat complicated by the bushland areas and road side vegetation between the Study Area and low fuel areas. However, on a State, regional or sub-regional basis, the proximity to good.

Grassland areas have a credible basis for areas of BAL:Low to arise in conjunction with new development. This is because the separation distances to achieve an area of BAL:Low or an even larger area tend to be highly achievable as grasslands are removed in completed urban development. This is recommended in this report and would have the effect of overcoming current issues associated with travelling north past bushland and on roads with roadside vegetation.

Access in completed development to areas of BAL:Low will be immediate and available by walking.

#### 7.1.4 Site based exposure

*c13.02-1S Bushfire Planning* provides directions for planning authorities about the level of acceptable exposure for new development enabled by a planning scheme amendment:

- *Not approving any strategic planning document, local planning policy, or planning scheme amendment that will result in the introduction or intensification of development in an area that has, or will on completion have, more than a BAL-12.5 rating under AS3959-2018.*
- *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 AS3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia).*

The assessment of site-based exposure confirms that development can be set back from bushfire hazards to achieve a radiant heat flux of less than 12.5kw/sq.m in completed development. Based on this, exposure of future development would be consistent with *c13.02-1S Bushfire Planning*.

The setbacks proposed and the interface treatments recommended in this report manage the risk from local and site scale hazards, especially those to the immediate north and east of the Study Area.

#### 7.1.5 Areas of high biodiversity conservation value

*c13.02-1S Bushfire Planning* provides directions on situations where bushfire and high biodiversity conservation values correlate:

- *Ensure settlement growth and development approvals can implement bushfire protection measures without unacceptable biodiversity impacts by discouraging settlement growth and development in bushfire affected areas that are of high biodiversity conservation value.*

It is beyond the scope of this report to assess the biodiversity conservation value of vegetation that may need to be removed or managed because of bushfire requirements.

A recommended design response is provided where hazardous vegetation remains or is introduced on the Study Area, although these areas should be carefully planned.

#### 7.1.6 No increase in risk

*c13.02-1S Bushfire Planning* provides an overall view of acceptable risk:

- *Ensuring the bushfire risk to existing and future residents, property and community infrastructure will not increase as a result of future land use and development.*
- *Achieving no net increase in risk to existing and future residents, property and community infrastructure, through the implementation of bushfire protection measures and where possible reduce bushfire risk overall.*

The Study Area is consistent with the bushfire policies and directions contained in the planning scheme. There is no planning scheme bushfire factor that would warrant urban growth not proceeding in the Study Area. The risk from bushfire can be managed in accordance with standard planning responses to bushfire hazards, including through the mitigation arising from the *Design Guidelines: Settlement Planning at the Bushfire Interface (DELWP 2020)*.

#### **7.2 c44.06 Bushfire Management Overlay**

The Bushfire Management Overlay applies to some land in the north and east part of the Study Area. A future planning permit will be required to subdivide the land.

The requirements of *c53.02 Bushfire* can be met as they relate to the following approved measures, including:

- AM2.2 - Siting of development within a proposed lot.
- AM2.3 – Building design.
- AM3.1 - Defendable space and construction standards.
- AM4.1 - Water supply and emergency vehicle access.
- AM5.3 - Perimeter road adjoining permanent hazards.

The planning scheme requirements for vegetation management for bushfire purposes in *c53.02 Bushfire Table 6 Vegetation management* requirements will be applied to all developed areas subject to the Bushfire Management Overlay.

For a strategic planning document and a planning scheme amendment, site-based exposure must be less than 12.5kw/sq.m of radiant heat. This is lower than required for a planning permit application under the Bushfire Management Overlay, enhancing bushfire safety. It will be necessary that the lower exposure requirements is included in the planning scheme amendment to ensure any future planning permit application does not default back to the Bushfire Management Overlay requirements.

Approved *measure AM2.1* requires that the risk from the landscape beyond a site be mitigated to an acceptable level. The bushfire hazard landscape assessment in this report demonstrates that the landscape risk is manageable, with Landscape type 2 assessed.

The subject site will be fully serviced with reticulated water and a street hydrant system. Approved Measure AM4.1 will require a static water supply for private use to be provided for each lot.

Based on the assessments contained in this report, the Study Area within the Bushfire Management Overlay would satisfy *c53.02 Bushfire Planning* requirements relevant when assessing a future planning application.

### **7.3 c13.02 Use and development control in a bushfire prone area**

Planning consideration is required under the *c13.02-1S Use and development control in a bushfire prone area* for the proposal. The use and development control requires that when assessing a planning permit application:

- *Consider the risk of bushfire to people, property and community infrastructure.*
- *Require the implementation of appropriate bushfire protection measures to address the identified bushfire risk.*
- *Ensure new development can implement bushfire protection measures without unacceptable biodiversity impacts.*

The Use and development control in a bushfire area will apply to future planning applications to subdivide the land into more than 10 lots. The Use and development control will assist to derive comparable outcomes to the parts of the land within the Bushfire Management Overlay, supported by bushfire content in any future planning scheme amendment.

The mitigation arising from the *Design Guidelines: Settlement Planning at the Bushfire Interface (DELWP 2020)*, along with the strategic, landscape, local and site scale assessments in this report, demonstrate that the Use and development control can be satisfied.

The subject site is within a designated Bushfire Prone Area under *the Building Regulations 2018*. A dwelling within the Bushfire Prone Area is required to be constructed to a BAL12.5 (focused on ember protection). This is consistent with the outcome required for development enabled by a planning scheme amendment.

### **7.4 Conclusion**

The urban development of the Study Area is consistent with the bushfire policies and directions contained in the planning scheme. There is no planning scheme bushfire factor that would warrant urban development not proceeding.

More specifically, this report has considered and demonstrated that urban development can comply with:

- *c13.02-1S Bushfire Planning.*
- *c44.06 Bushfire Management Overlay.*
- *c13..02-1S Use and development control in a bushfire prone area* (which is triggered for the future subdivision of the land)

Recommendations in this report are intended to reiterate the key design that should be integrated into the masterplan and planning scheme amendment. These should operate in the planning scheme as local content.

## 8. Recommendations

Based on the assessments contained in this report, the following recommendations should be accommodated in the planning scheme amendment to rezone the Study Area for urban development.

### Recommendation 1: Interfaces with a bushfire hazard

Development will be required to be set back from bushfire hazards for a distance no less than that required to ensure exposure is less than 12.5kw of radiant heat. This equates to Column A in Table 2 to *c53.02 Bushfire* in the planning scheme.

Required setbacks for hazardous vegetation remaining or added to the Study Area:

- Forest – 48m
- Woodland – 33m
- Grassland – 19m
- Localised hazards – 20m

Constructed (perimeter) roads should be used as part of the above setbacks.

### Recommendation 2: Vegetation in completed development

*c53.02 Bushfire Planning, Table 6 Vegetation management requirements* should be applied to all lots for Accommodation which are more than 1,200sq.m and will be required under *c53.02 Bushfire Planning* for all lots within the Bushfire Management Overlay.

#### Note:

As a result of Recommendations 1, 2 and 3, a future planning scheme amendment will result in development exposed to less than 12.5kw/sq.m of radiant heat and will result in large areas of BAL:Low within the Study Area.

### Recommendation 3: Movement network

A movement network in the Study Area should enable a res-code style road network that enables people to *move away on foot from hazard interfaces*. Multiple roads away from hazard interfaces towards the centre of the Study Area should be provided.

### Recommendation 4: Non-combustible fencing

Lots larger than 1,200sq.m within a lower density precinct should be required to have non-combustible fencing.

### Recommendation 5: Planning scheme controls

The recommendations in this report should form part of the planning scheme to ensure recommendations are given statutory effect at the time subsequent statutory approvals are sought (for example, a development plan or planning permit application).

Figure 8a: Bushfire vegetation management standards (defendable space)  
Table 6 to *c53.02 Bushfire Planning*

- Grass must be short cropped and maintained during the declared fire danger period.
- All leaves and vegetation debris must be removed at regular intervals during the declared fire danger period.
- Within 10 metres of a building, flammable objects must not be located close to the vulnerable parts of the building.
- Plants greater than 10 centimetres in height must not be placed within 3 metres of a window or glass feature of the building.
- Shrubs must not be located under the canopy of trees.
- Individual and clumps of shrubs must not exceed 5 sq. metres in area and must be separated by at least 5 metres.
- Trees must not overhang or touch any elements of the building.
- The canopy of trees must be separated by at least 5 metres.
- There must be a clearance of at least 2 metres between the lowest tree branches and ground level.

Figure 8A: Recommended bushfire setbacks to dwellings or building envelopes

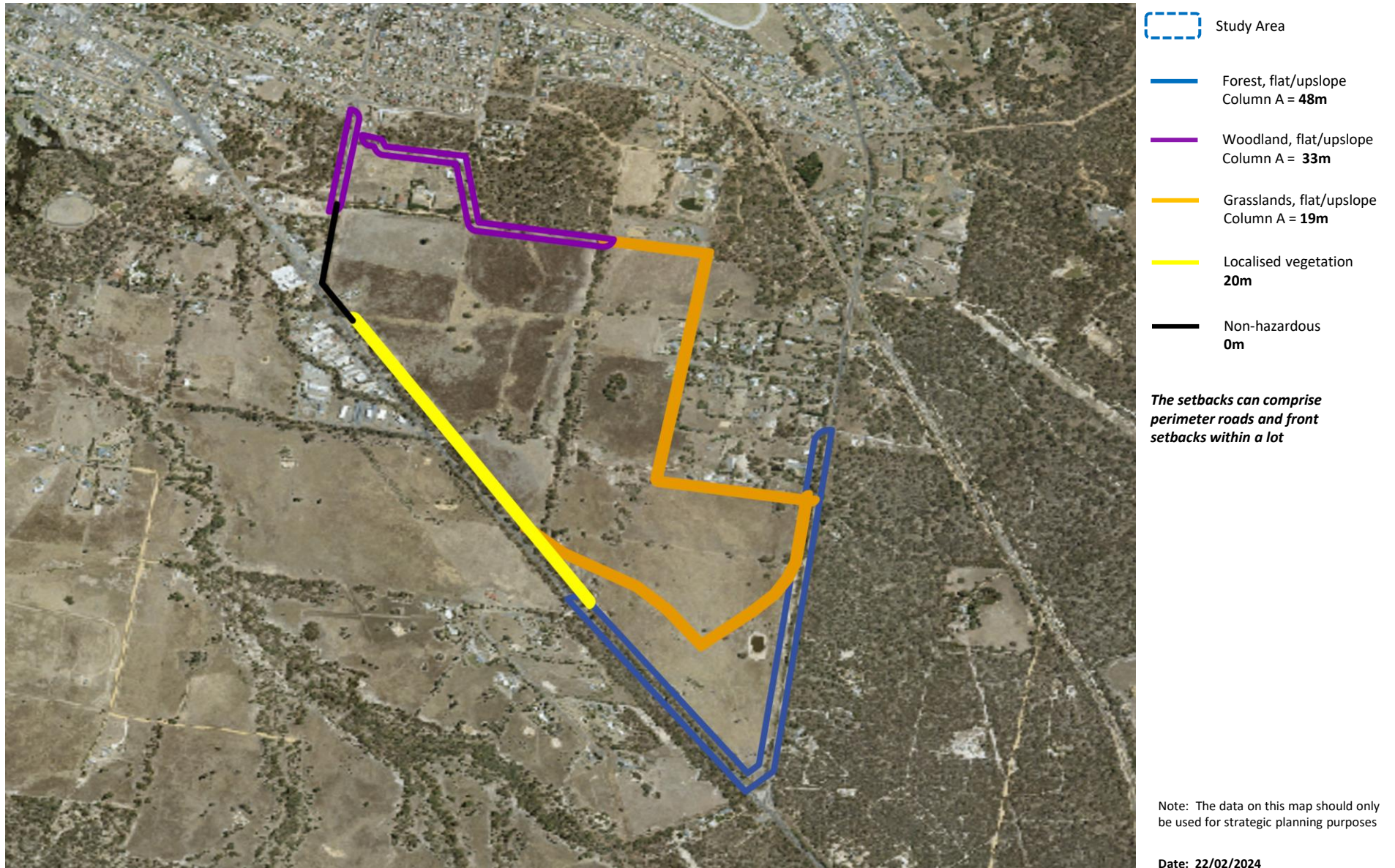
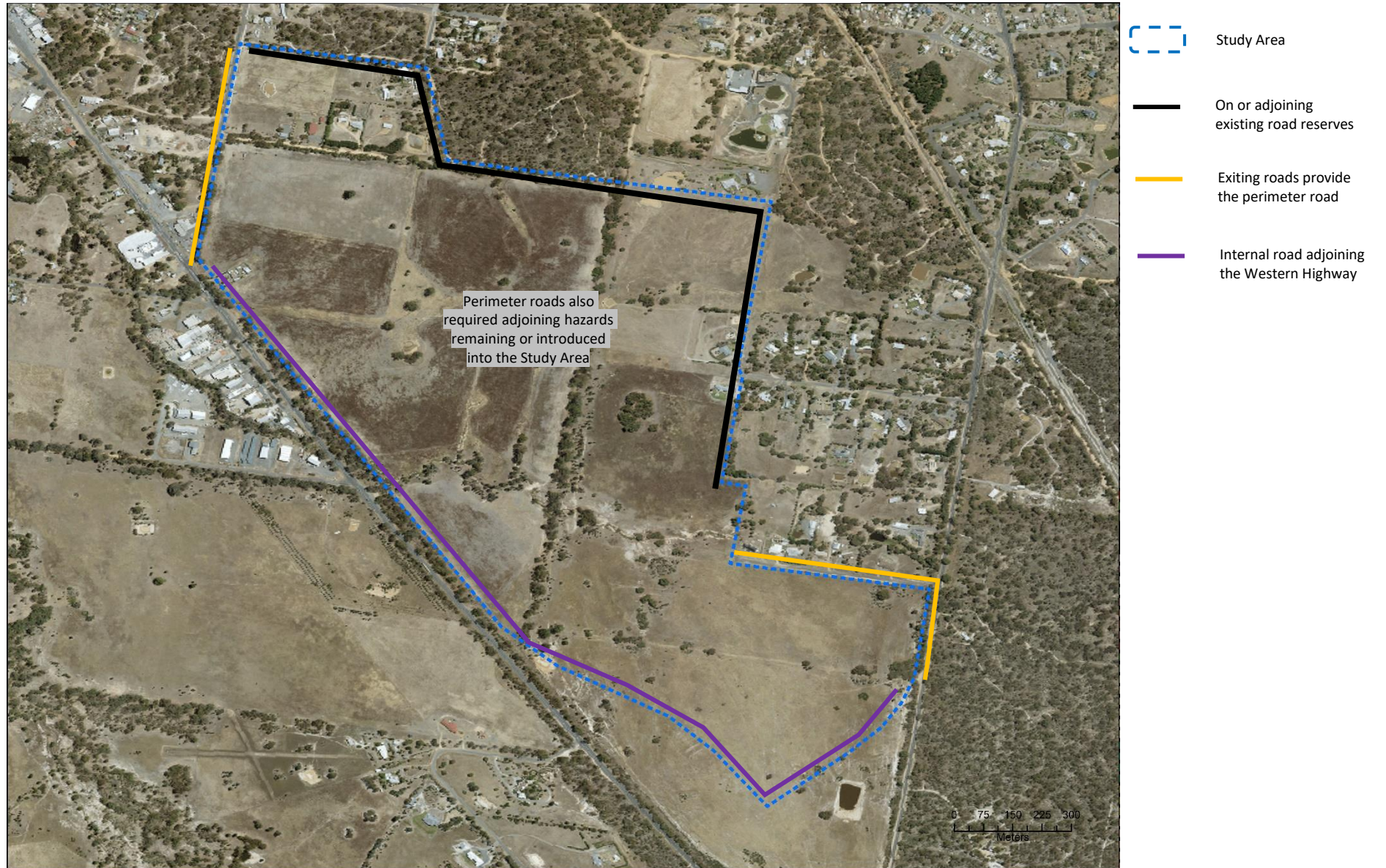


Figure 8B: Recommended perimeter road locations





## 9. Views of the relevant fire authority

### The views of the relevant fire authority

c13.02-15 *Bushfire Planning* identifies that a key element of a risk assessment is to:

- *Consult[...] with [...] the relevant fire authority early in the process to receive their recommendations and implement appropriate bushfire protection measures.*

The CFA were consulted on a draft of this report.

[REDACTED]

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