



Bushfire Management Plan

Local Structure Plan

Anstey Road, Forrestdale
City of Armadale

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Document Information

Prepared for: Anstey Road Development Pty Ltd
Project Name: Local Structure Plan
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Document Control

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Front cover photo: Post development BAL contours over the site

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EXECUTIVE SUMMARY

This Bushfire Management Plan (BMP) has been prepared to support a Local Structure Plan (LSP) and provide guidance for future subdivision. The proposal consists of a large number of residential lots, Public Open Space and a school, as shown in Figure 1. The 55 hectare site is in Forrestdale, 6 kilometres west of Armadale City Centre. It currently contains rural lifestyle lots used predominantly as equine properties (Figure 2).

There are multiple lots constituting the site, most are under the ownership of LWP Property. A small number of lots are currently under negotiation regarding future ownership and management arrangements.

All areas within 150 metres (m) of the site boundary have been assessed for vegetation classification and bushfire hazard levels. Post development bushfire prone areas have been identified and are concentrated around the northern and eastern perimeter of the site. A Method 1 Bushfire Attack Level (BAL) assessment has been undertaken to determine predicted radiant heat flux levels on the site and building envelopes within the lots are not exposed to predicted radiant heat flux levels exceeding 29kW/m² once conditions have been met. Future freehold lots will accommodate dwellings to BAL ratings of BAL-29 and lower. The completed urban subdivisions will accommodate dwellings in predominantly BAL-LOW areas. Predicted radiant heat impacts at higher levels are absorbed in the internal and perimeter road network, as well as adjacent landscaped parklands.

A future Asset Protection Zone (APZ) on the bushland interface zone will occupy the minimum BAL-40 and BAL-FZ exposed areas ensuring future development complies with acceptable standards.

The BMP complies with Policy measure 6.3 of SPP 3.7 because it demonstrates that compliance with the bushfire protection criteria in the Guidelines for Planning in Bushfire Prone areas can currently be achieved, in addition to subsequent subdivision stages.

Each future subdivision stage will need to demonstrate full compliance with relevant sections of SPP 3.7 and the Guidelines for Planning in Bushfire Prone Areas.

It is expected that the implementation of this BMP will reduce the threat to future residents, the public and fire fighters in the area addressed by this BMP. The proposal complies with the *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* and the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3)*.

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1 PROPOSAL DETAILS

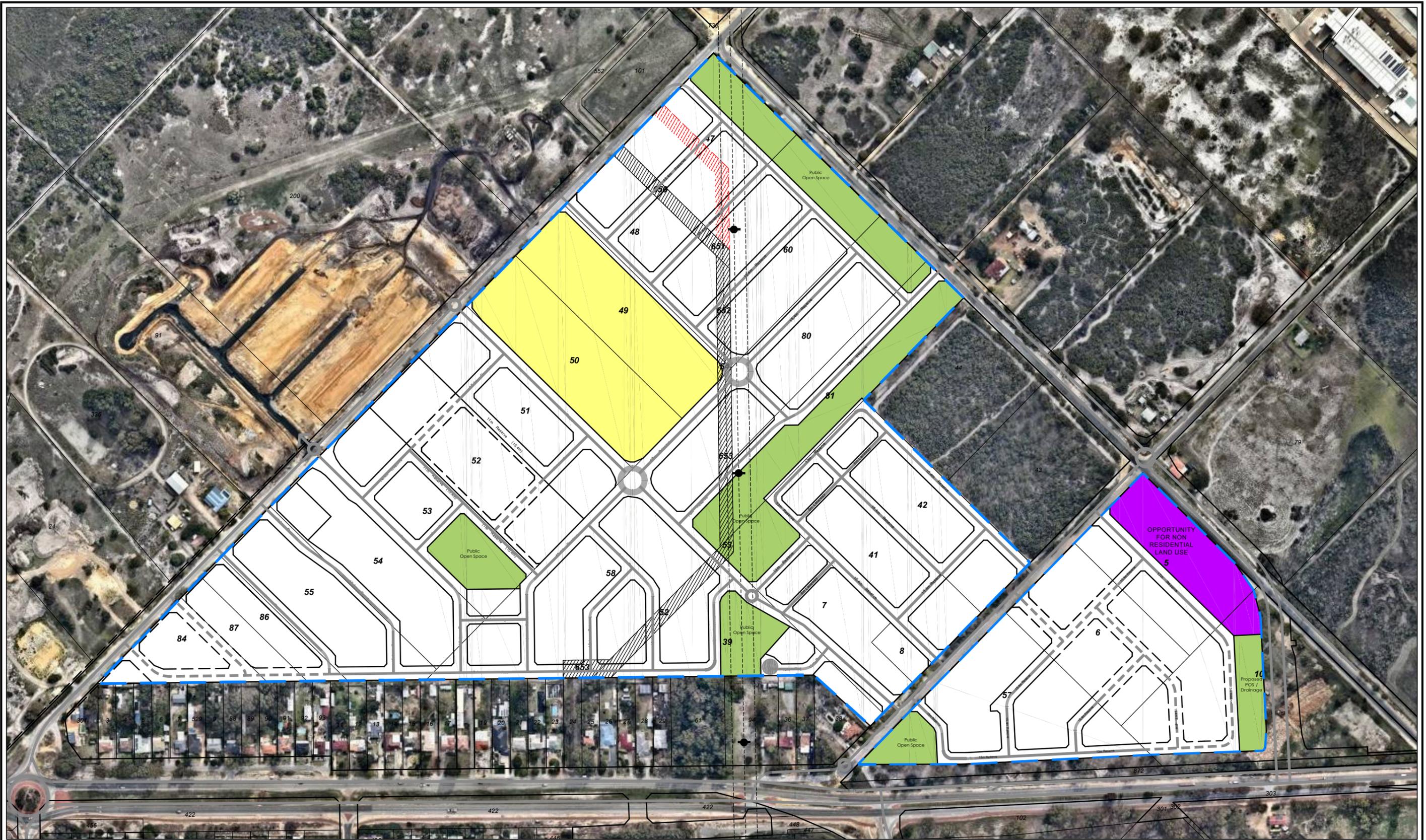
This Bushfire Management Plan (BMP) has been prepared to support a Local Structure Plan (LSP) for the site which includes various lots, as shown in Figure 1. The site is located in Forrestdale, 6 kilometres west of Armadale City Centre (Figure 2). The site is approximately 55 hectares in size and currently contains rural residential lifestyle lots used predominantly as equine properties. The LSP proposes residential development over most of the site, as well as a primary school. There are four Public Open Space (POS) reserves, including Water Corporation's Bailey Branch Drain which is an open drain that transects the site generally from north to south (Figure 1).

All POS areas will be landscaped according to the Landscape Masterplan. This demonstrates one small area of remnant vegetation will be retained in one POS reserve, however it will be less than 0.5 ha in size and not located within 100 metres of any other areas of classified vegetation. The Living Stream corridor will be a managed and maintained public reserve. The corridor will require permanent ongoing management in order to function both as a useable POS for recreation and for its stormwater drainage function. POS management will include removal of fine fuels (leaf litter, twigs etc), standard weed management (herbicide application and hand removal as required), and tree pruning for safety and amenity. All POS areas except the western most will comply with the Exclusion Clause 2.2.3.2(f) in AS3959-2018 as "Parklands and reserves with highly managed low threat vegetation". The POS in the western end of the LSP area will be isolated from other areas of classified vegetation and less than 1ha in size.

Land to the north of Keane Road is the Metropolitan Redevelopment Authority's Forrestdale West Business Park Estate, and land on the western side of Anstey Road contains large rural lifestyle lots. These areas have recently been re-zoned from rural to urban under the Metropolitan Regional Scheme and residential development has commenced west of Anstey Road. Vegetation has been removed and bushfire hazard reduced.

Acceptable solutions are achieved at the site, but performance solutions could also be proposed at the future subdivision stages depending on the subdivision proposal and circumstances. Each future subdivision stage will need to demonstrate full compliance with relevant sections of SPP 3.7 and the Guidelines for Planning in Bushfire Prone Areas.

If there is a bushfire within or near the site, implementing this BMP will reduce the threat to residents, property and emergency response personnel.



Location details: Anstey Road, Anstey East
Forrestdale

Assessment date: July, 2017

Prepared by: Bushfire Safety Consulting

Accreditation level: Level 3 BPAD Practitioner

Accreditation number: BPAD 23160

Accreditation expiry date: 31st January, 2021

Date aerial photo: May 2020

FIGURE 1 -LOCAL STRUCTURE PLAN

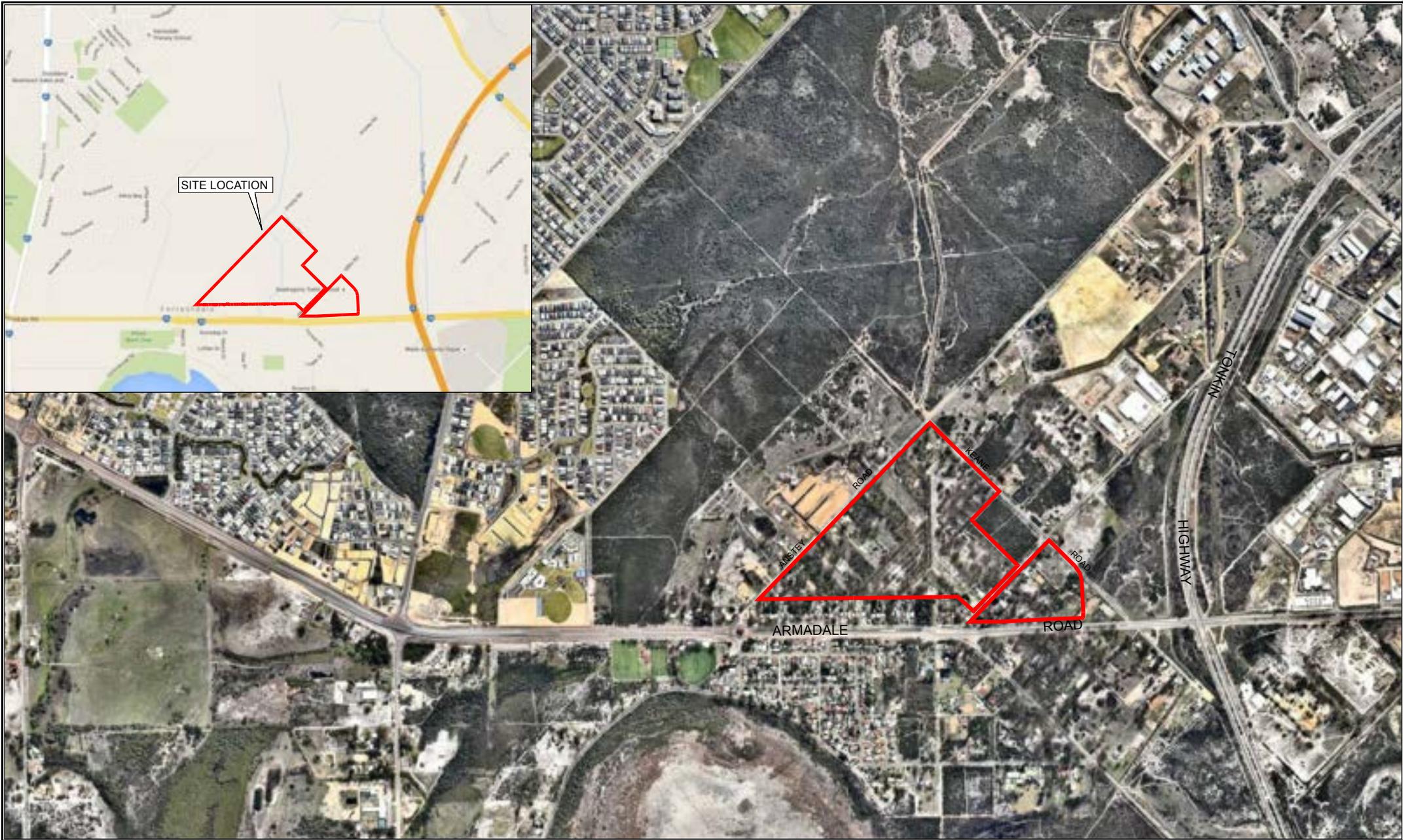
0 50 100 150m
SCALE 1:4000 @ A3
DATE: JULY 2020



LEGEND

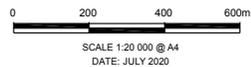
-  SUBJECT LAND
-  PRIMARY SCHOOL
-  POS RESERVES

SOURCE OF PHOTOGRAPHY: NEARMAP



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Date aerial photo: May 2020

FIGURE 2
SITE LOCATION PLAN



LEGEND

 SUBJECT LAND

Base mapping supplied by Nearmap & Google Maps

2 Policy and Guidelines

2.1 Policy and Guidelines

2.1.1 Application of SPP 3.7

The *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP 3.7)* provides the foundation for land use planning to address bushfire risk management in Western Australia. It is used to inform and guide decision makers, referral agencies and land owners/proponents to help achieve acceptable bushfire protection outcomes.

The policy contains objectives and policy measures as well as reference to the bushfire protection criteria as outlined in the *Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3; the Guidelines)*. The policy applies to this proposed Local Structure Plan amendment as the site being assessed is located in a designated bushfire prone area on the WA map of Bushfire Prone Areas (Figure 3).

The following policy measures will need to be comply with SPP 3.7:

Table 1. Policy measures

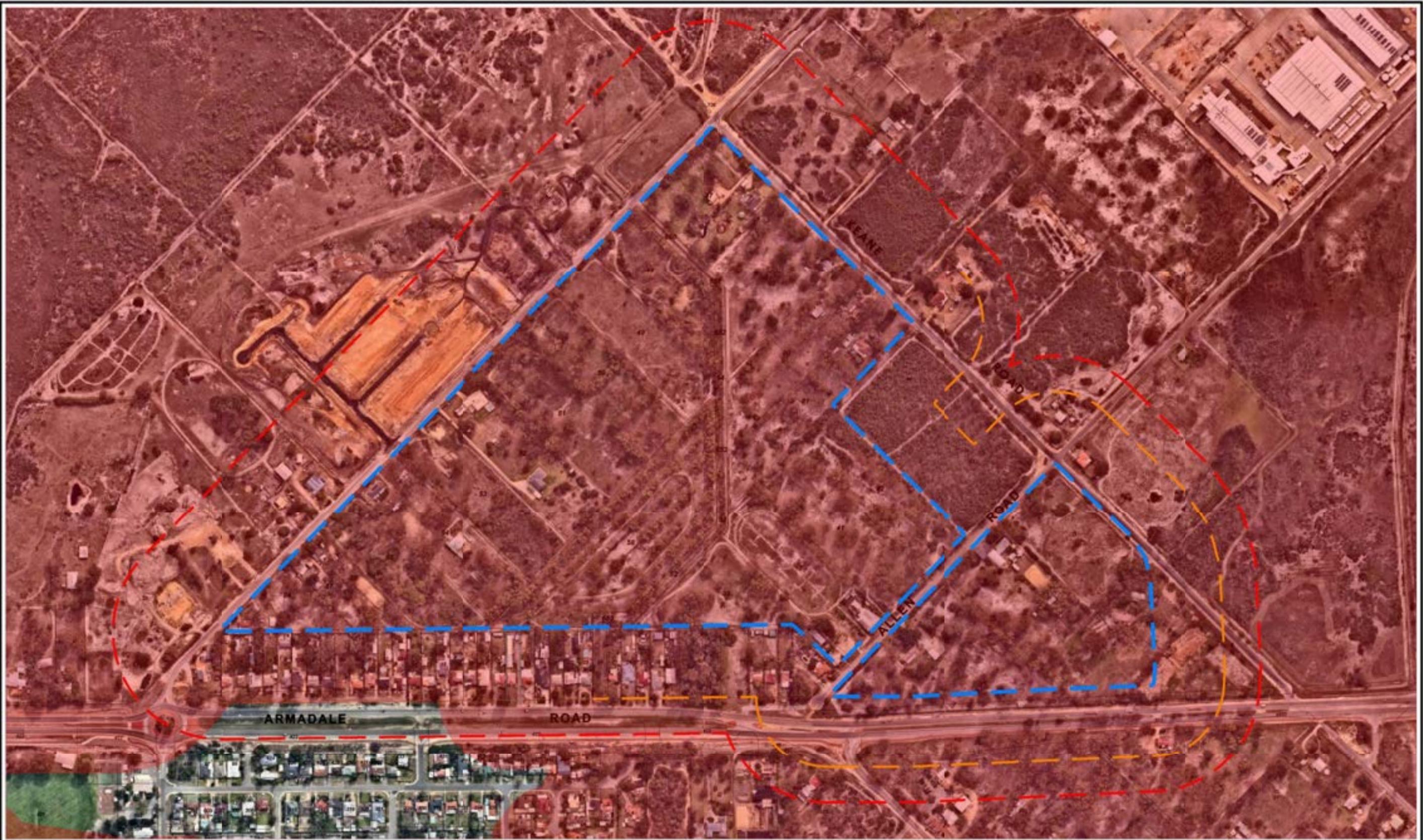
Policy Measure 6.2	The LSP application is located within a designated bushfire prone area and will have a Bushfire Hazard Level above low and a Bushfire Attack Level rating above BAL-LOW.
Policy Measure 6.3	Policy 6.3 applies, meaning the LSP proposal will be accompanied by a Bushfire Management Plan including the following: <ul style="list-style-type: none"> - BAL Contour Plan - BAL ratings - Identification of relevant issues; and - Demonstration of compliance with the Guidelines
Policy Measure 6.6	Policy Clause 6.6 applies to vulnerable land use applications. The site will accommodate a school in the future. A proposed school is considered a vulnerable land use under the policy. A future development application for the school will therefore include a comprehensive bushfire management plan and emergency evacuation procedures which specifically reflects the users' needs and circumstances if the area is still designated as bushfire prone at the time of development.

The proposal does not propose any high-risk land use and is not considered as minor or unavoidable development under *SPP 3.7*.

2.1.2 Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)

The Department of Planning have recently released the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)*. The requirements of this document are accommodated within this BMP.

The *Guidelines for Planning in Bushfire Prone Areas V 1.3(2017)* is intended to inform and guide decision makers, referral authorities and proponents to achieve acceptable bushfire protection outcomes, including expectations at the different stages of planning.



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 Date aerial photo: May 2020

FIGURE 3
BUSHFIRE PRONE
AREAS


 SCALE 1:5000 @ A3
 DATE: JULY 2020


 NORTH

LEGEND
 SUBJECT LAND
 ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
 ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
 BUSHFIRE PRONE AREAS
 SOURCE OF PHOTOGRAPHY: NEARMAP



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3 ENVIRONMENTAL CONSIDERATIONS

3.1 Native Vegetation – Modification and Clearing

A detailed Environmental Assessment Report has been developed by Coterra Environment which identified the majority of the site as having been historically cleared of vegetation for stock grazing purposes. A botanical survey undertaken in 2016 found only limited areas of remnant vegetation on the site. There are no environmental restrictions or limitations applicable to the site achieving the LSP design and there are no threatened ecological communities.

3.2 Re-vegetation/Landscape Plans

The landscape masterplan shows all POS areas will receive intensive landscaping and maintenance (see Appendix 4). The drainage corridor through the middle of the site will be extensively landscaped. Some separated existing trees will be maintained, however understorey will be removed and replaced with irrigated turf, foot and bike paths, playground and picnic shelters. One clump of trees and remnant vegetation will be retained in the rectangular shaped POS area in the western half of the site. This will be less than 1 ha in size and will be separated from all other areas of classified vegetation by more than 100 metres. It therefore becomes excluded under clause 2.2.3.2(b) in AS3959-2018 and is not a bushfire threat to the surrounding development.

The Living Stream corridor will be a managed and maintained public reserve. The corridor will require permanent ongoing management in order to function both as a useable POS for recreation and for its stormwater drainage function. All internal Public Open Space will be designed and maintained to be low bushfire risk and will consist of irrigated turf and cultivated gardens. POS management will include removal of fine fuels (leaf litter, twigs etc), removal of weeds including regenerating Eucalypts and Wattles not part of the landscaping plan (herbicide application and hand removal as required), tree pruning for safety and amenity (including removal of lower branches to 2 metres from ground level), removal of dead and diseased plants, pruning, mulch top-ups, and rubbish removal.

4 BUSHFIRE ASSESSMENT RESULTS

Bushfires are common in the City of Armadale and local brigades respond to numerous bushfires in the district annually. Given the bushfire threat in the area this BMP plays a critical role in ensuring that any future development of the land appropriately mitigates the risk from bushfire.

4.1 Assessment Inputs

The methodology used to assess the site is outlined in the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)*. Assessing bushfire threat at the site-specific level accounts for the predominant class of vegetation on the site and surrounding area for a minimum of 150 m, as shown in Figure 4B.

4.1.1 Vegetation Classification

The site contains largely managed properties with Class B Woodland and Class G Grassland vegetation dominant. The dominant eucalypt tree on the site is *Eucalyptus camaldulensis* (River Red Gum) and accumulated leaf litter adds to the bushfire hazard under areas of Eucalypt canopy. These areas will all be cleared for the future development or altered into managed landscapes in the internal parks and reserves. The existing woodland structured vegetation contains minimal intermediate or elevated fuel layers and commonly has a grassy understorey.

Lots 43 and 44 on the eastern boundary contains Banksia and Allocasuarina species with degraded understorey of grassland and is classed as Class B Woodland (Plot 1). *Kunzea glabrescens* dominated Class D scrub (Plot 2) also occurs which provides an intact fuel structure and high fuel loadings. The canopy averages 5 metres in height and a connected fuel structure from ground level.

North-east of Keane Road, Class D Scrub and Class G Grassland are the dominant vegetation classifications. North-west of Anstey Road, vegetation is currently being removed to accommodate adjacent land developments. There are small area of remnant Class B Woodland and Class D Scrub. The dominant vegetation class is Class Grassland. Bushfire Hazard continues to be reduced in this area. Areas with eucalypt overstorey occur south of Armadale Road and pose an ember attack threat to the site only due to the wide Armadale Road Reserve and proposed road widening works.

The vegetation plots on and surrounding the site within 150 metres of the site boundary are found in the plot descriptions below, as well as in Figure 4. This represents the final condition of the site once fully developed with landscaped POS areas.

<p>Photo ID: 1</p> <p>Plot Number: 1</p> <p>Vegetation Classification or Exclusion Clause: Class B Woodland</p> <p>Description/Justification of Classification: Banksia trees 10-30 m high with canopy cover 10 to 30%. Understorey consists predominately of small shrubs and Xanthorrhoea.</p>	
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Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestsdale

<p>Photo ID: 2</p> <p>Plot Number: 1</p> <p>Vegetation Classification or Exclusion Clause: Class B Woodland</p> <p>Description/Justification of Classification: Eucalypt trees 10-30 m high with canopy cover 10 to 30%. Understorey consists predominately of pasture grasses.</p>	
<p>Photo ID: 3</p> <p>Plot Number: 1</p> <p>Vegetation Classification or Exclusion Clause: Class B Woodland</p> <p>Description/Justification of Classification: Eucalypt trees 10-30 m high with canopy cover 10 to 30%. Understorey consists predominately of pasture grasses with the occasional large shrub.</p>	
<p>Photo ID: 4</p> <p>Plot Number: 2</p> <p>Vegetation Classification or Exclusion Clause: Class D Scrub</p> <p>Description/Justification of Classification: Large shrubs 2 to 6 metres tall. Occasional Eucalypt present with canopy cover less than 10%.</p>	
<p>Photo ID: 5</p> <p>Plot Number: 2</p> <p>Vegetation Classification or Exclusion Clause: Class D Scrub</p> <p>Description/Justification of Classification: Large shrubs 2 to 6 metres tall. Occasional Eucalypt present with canopy cover less than 10%.</p>	

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestdale

<p>Photo ID: 6</p> <p>Plot Number: 2</p> <p>Vegetation Classification or Exclusion Clause: Class D Scrub</p> <p>Description/Justification of Classification: Large shrubs 2 to 6 metres tall. Occasional Eucalypt present with canopy cover less than 10%.</p>	
<p>Photo ID: 7</p> <p>Plot Number: 2</p> <p>Vegetation Classification or Exclusion Clause: Class D Scrub</p> <p>Description/Justification of Classification: Degraded area of regrowth scrub vegetation 2-3 m high. Areas currently being cleared for land development (see foreground of photo).</p>	
<p>Photo ID: 8</p> <p>Plot Number: 3</p> <p>Vegetation Classification or Exclusion Clause: Class A Forest</p> <p>Description/Justification of Classification: Eucalypts 10-30 m tall with 30-70% foliage cover and scrub understorey.</p>	
<p>Photo ID: 9</p> <p>Plot Number: 3</p> <p>Vegetation Classification or Exclusion Clause: Class A Forest</p> <p>Description/Justification of Classification: Eucalypts 10-30 m tall with 30-70% foliage cover and grass understorey.</p>	

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestdale

<p>Photo ID: 10</p> <p>Plot Number: 3</p> <p>Vegetation Classification or Exclusion Clause: Class A Forest</p> <p>Description/Justification of Classification: Eucalypts 10-30 m tall with 30-70% foliage cover and grass understorey.</p>	 <p>Photo 10: A dense forest of tall eucalypt trees with a grassy understorey. The image includes a metadata overlay at the top with the following text: DIRECTION 137 deg(T), 32.14792°S, ACCURACY 18 m, DATUM WGS84. At the bottom, it reads: Anstey29, 2018-07-03, 11:34:59+08:00.</p>
<p>Photo ID: 11</p> <p>Plot Number: 4</p> <p>Vegetation Classification or Exclusion Clause: Class G Grassland</p> <p>Description/Justification of Classification: Unmanaged grassland > 100mm long.</p>	 <p>Photo 11: A wide, open grassland field under a cloudy sky. The image includes a metadata overlay at the top with the following text: DIRECTION 180 deg(T), 32.14429°S, ACCURACY 5 m, DATUM WGS84. At the bottom, it reads: Anstey5, 2018-07-03, 10:24:27+08:00.</p>
<p>Photo ID: 12</p> <p>Plot Number: 4</p> <p>Vegetation Classification or Exclusion Clause: Class G Grassland</p> <p>Description/Justification of Classification: Pasture grassland > 100mm long.</p>	 <p>Photo 12: A grassy field next to a paved road with a utility pole. The image includes a metadata overlay at the top with the following text: DIRECTION 3 deg(T), 32.14776°S, ACCURACY 100 m, DATUM WGS84. At the bottom, it reads: Anstey28, 2018-07-03, 11:19:01+08:00.</p>
<p>Photo ID: 13</p> <p>Plot Number: 4</p> <p>Vegetation Classification or Exclusion Clause: Class G Grassland</p> <p>Description/Justification of Classification: Unmanaged grassland > 100mm long.</p>	 <p>Photo 13: A grassy field with a fence line in the foreground. The image includes a metadata overlay at the top with the following text: DIRECTION 61 deg(T), 32.14326°S, ACCURACY 18 m, DATUM WGS84. At the bottom, it reads: Anstey33, 2018-07-03, 11:25:39+08:00.</p>

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestsdale

<p>Photo ID: 14</p> <p>Plot Number: 4</p> <p>Vegetation Classification or Exclusion Clause: Class G Grassland</p> <p>Description/Justification of Classification: Unmanaged grassland > 100mm long.</p>	 <p>Photo 14 shows a grassy field with a wooden platform and a fence. The background features a line of trees under a cloudy sky. The photo includes a data overlay at the top with 'DIRECTION 278 deg(T)', '32.14384°S', and '115.93976°E'. At the bottom, it is labeled 'Anstey38' and '2018-07-03 11:42:11+08:00'.</p>
<p>Photo ID: 15</p> <p>Plot Number: 4</p> <p>Vegetation Classification or Exclusion Clause: Class G Grassland</p> <p>Description/Justification of Classification: Pasture grassland > 100mm long.</p>	 <p>Photo 15 shows a wide view of a grassy field with a fence. In the background, there are several trees and a building. The sky is blue with some clouds. The photo includes a data overlay at the top with 'DIRECTION 282 deg(T)', '32.14384°S', and '115.93976°E'. At the bottom, it is labeled 'Anstey46' and '2018-07-03 11:57:28+08:00'.</p>
<p>Photo ID: 16</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/Justification of Classification: Low threat vegetation – cultivated gardens and managed lawn.</p>	 <p>Photo 16 shows a residential area with a lawn, a house, and trees. A utility pole is visible in the foreground. The photo includes a data overlay at the top with 'DIRECTION 96 deg(T)', '32.14384°S', and '115.94005°E'. At the bottom, it is labeled 'Anstey2' and '2018-07-03 10:16:35+08:00'.</p>
<p>Photo ID: 17</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/Justification of Classification: Low threat vegetation – managed road reserve.</p>	 <p>Photo 17 shows a road reserve with a grassy area and a road. A white van is visible on the road. The photo includes a data overlay at the top with 'DIRECTION 266 deg(T)', '32.14776°S', and '115.94349°E'. At the bottom, it is labeled 'Anstey28' and '2018-07-03 11:01:37+08:00'.</p>

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestdale

<p>Photo ID: 18</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/Justification of Classification: Low threat vegetation – managed road reserve.</p>	 <p>DIRECTION 130 deg(T) 32.14784°S 115.94352°E ACCURACY 5 m DATUM WGS84</p> <p>Anstey21 2018-07-03 11:02:22+08:00</p>
<p>Photo ID: 19</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/Justification of Classification: Low threat vegetation – managed road reserve.</p>	
<p>Photo ID: 20</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/Justification of Classification: Low threat vegetation – maintained lawn and cultivated gardens.</p>	
<p>Photo ID: 21</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (f)</p> <p>Description/Justification of Classification: Low threat vegetation – maintained lawn and cultivated gardens.</p>	

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestsdale

<p>Photo ID: 22</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (b)</p> <p>Description/Justification of Classification: Area surrounding Class D Scrub vegetation to be cleared leaving less than 1 hectare of vegetation which is not within 100m of other classified vegetation.</p>	 <p>Photograph showing dense scrub vegetation on a grassy slope. The image includes a metadata overlay at the top with the following text: DIRECTION 155 deg(T), 32.14393°S, 115.94235°E, ACCURACY 5 m, DATUM WGS84. At the bottom, it reads 'Anstey44' and '2018-07-03 11:51:59+08:00'.</p>
<p>Photo ID: 23</p> <p>Plot Number: 5</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (b)</p> <p>Description/Justification of Classification: Area surrounding Class D Scrub vegetation to be cleared leaving less than 1 hectare of vegetation which is not within 100m of other classified vegetation.</p>	 <p>Photograph showing a grassy field with a line of trees in the background. The image includes a metadata overlay at the top with the following text: DIRECTION 120 deg(T), 32.14487°S, 115.94119°E, ACCURACY 5 m, DATUM WGS84. At the bottom, it reads 'Anstey41' and '2018-07-03 11:47:32+08:00'.</p>
<p>Photo ID: 24</p> <p>Plot Number: 6</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (e)</p> <p>Description/Justification of Classification: Current vegetation to be cleared for residential dwellings, roads and footpaths.</p>	 <p>Photograph showing trees and a fence line. The image includes a metadata overlay at the top with the following text: DIRECTION 107 deg(T), 32.14562°S, 115.94332°E, ACCURACY 10 m, DATUM WGS84. At the bottom, it reads 'Anstey7' and '2018-07-03 10:32:04+08:00'.</p>
<p>Photo ID: 25</p> <p>Plot Number: 6</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (e)</p> <p>Description/Justification of Classification: Current vegetation to be cleared for residential dwellings, roads and footpaths.</p>	 <p>Photograph showing a grassy area with several trees. The image includes a metadata overlay at the top with the following text: DIRECTION 158 deg(T), 32.14658°S, 115.94394°E, ACCURACY 5 m, DATUM WGS84. At the bottom, it reads 'Anstey16' and '2018-07-03 10:55:36+08:00'.</p>

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestdale

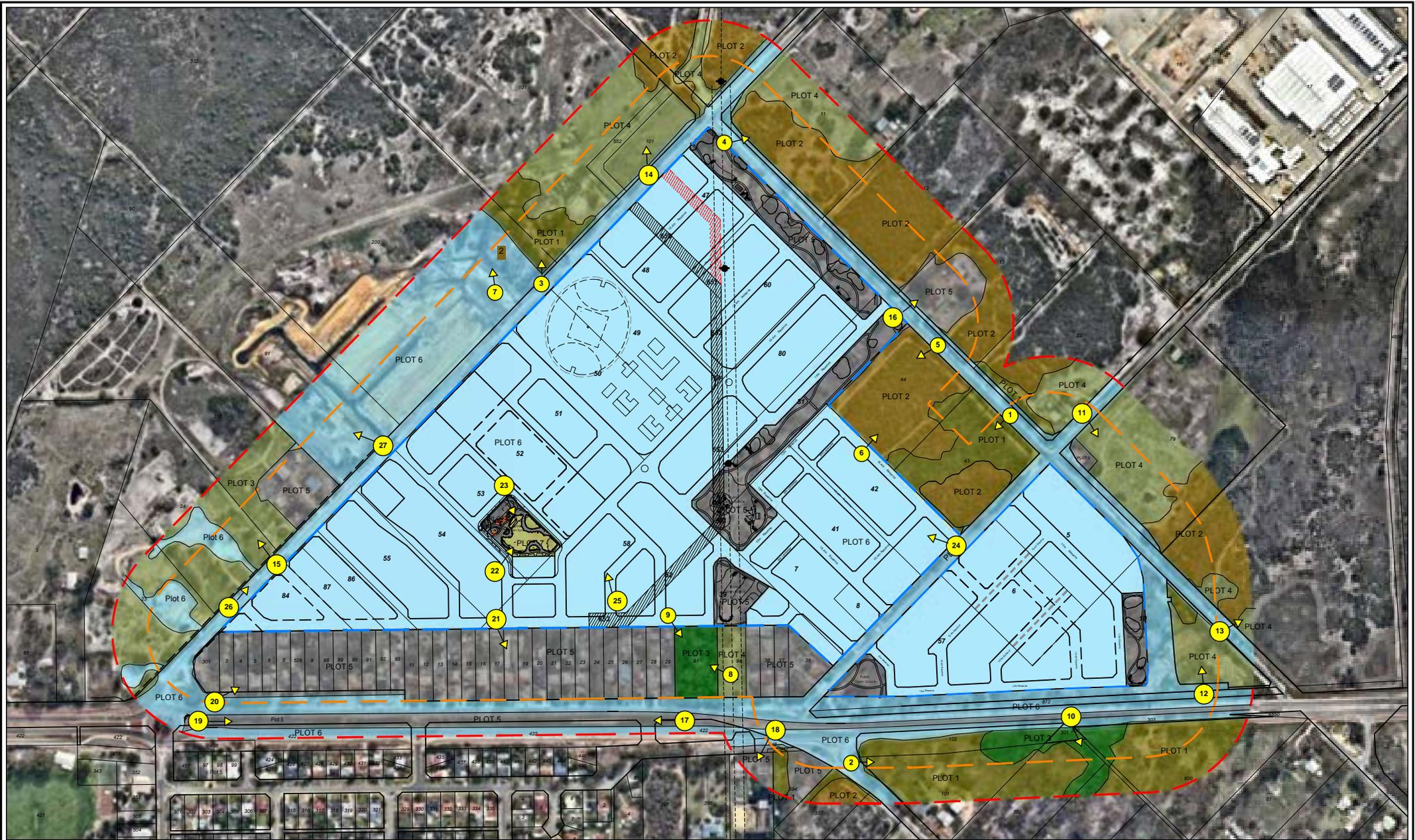
<p>Photo ID: 26</p> <p>Plot Number: 6</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (e)</p> <p>Description/justification of classification Non-vegetated areas - road</p>	
<p>Photo ID: 27</p> <p>Plot Number: 6</p> <p>Vegetation Classification or Exclusion Clause: Exclusion Clause 2.2.3.2 (e)</p> <p>Description/Justification of Classification: Non-vegetated areas – mineral earth</p>	

4.1.2 Effective Slope

The slope under classified vegetation surrounding the site was measured and assessed against digital contour data, and is flat perpendicular to the site boundary. There are no slopes that will increase the fire behaviour of an approaching fire front.

Table 2. Summary of vegetation type and effective slope

Vegetation Area/ Plot	Applied Vegetation Classification	Effective Slope under the Classified Vegetation (degrees)
1	Class B Woodland	Flat
2	Class D Scrub	Flat
3	Class A Forest	Flat
4	Class G Grassland	Flat



Location details: Anstey Road, Anstey East Forrestdale
 Assessment date: July, 2017
 Prepared by: Bushfire Safety Consulting
 Accreditation level: Level 3 BPAD Practitioner
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 Accreditation expiry date: 31st January, 2021
 Date aerial photo: May 2020

FIGURE 4 - VEGETATION CLASSIFICATION MAP (BAL CONTOUR MAP)

0 50 100 150 200m
 SCALE 1:5000 @ A3
 DATE: JULY 2020



LEGEND

- SUBJECT LAND
- ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- PHOTO LOCATION & DIRECTION
- SOURCE OF PHOTOGRAPHY: NEARMAP

- PLOT 1 CLASS B WOODLAND
- PLOT 2 - CLASS D SCRUB
- PLOT 3 CLASS A FOREST
- PLOT 4 - CLASS G GRASSLAND
- PLOT 5 - EXCLUSION CLAUSE 2.2.3.2(f)
- PLOT 6 - EXCLUSION CLAUSE 2.2.3.2(e)
- PLOT 7 - EXCLUSION CLAUSE 2.2.3.2(b)

bushfire safety
 CONSULTING
 Science. Culture. Solutions.
 PO BOX 84 STONEVILLE WA 6081
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 www.bushfiresafety.net

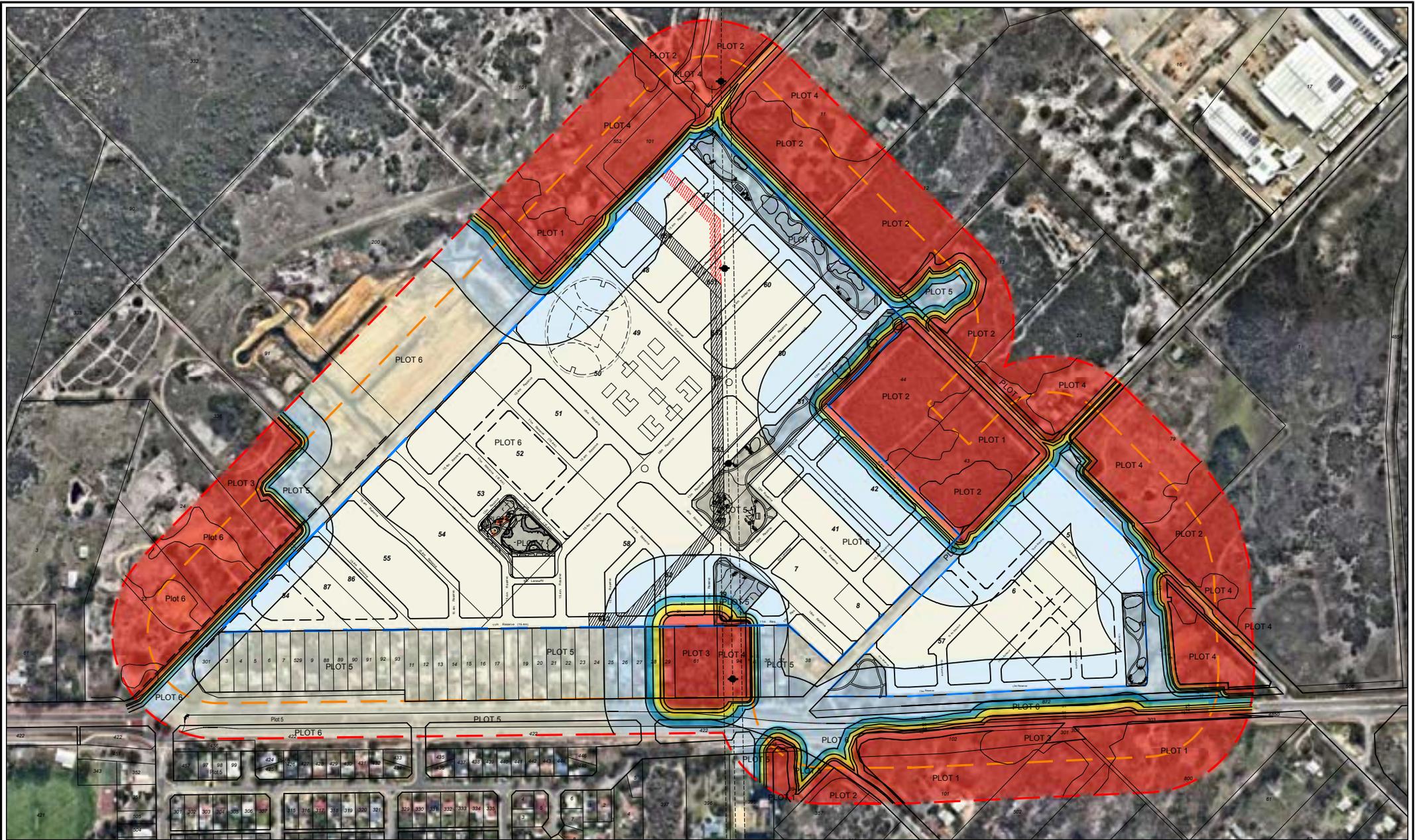
4.2 Assessment Outputs

The BAL contour assessment was undertaken according to Appendix 3 of the Guidelines and the results are found in Figure 5. The development of the road on the eastern and north-eastern interface will provide an increased setback between the site and the bushfire hazard. This road development is likely to occur prior to the eastern stages of the LSP. This will provide additional benefits to the site including reduced BAL ratings and improved road access.

A method 1 BAL Assessment was undertaken to determine the BAL contours impacting the site and the outputs are provided in Table 3. Figure 6 outlines the final developed scenario where the entire site is fuel reduced and in its fully developed condition.

Table 3. Summary of BAL assessment outputs around LSP interface

LSP interface	Plot No. & Vegetation Classification	Effective slope	Setback Distance to Vegetation		Highest BAL Contour
			External to lot	Internal	
North-east	Plot 2 Class D Scrub	Flat	15m	0 m	BAL-29 BAL-12.5
	Plot 1 Class B Woodland	Flat	15m	0 m	BAL-29 BAL-29
	Plot 4 Class G Grassland	Flat	30 m in Keane Road Reserve	0m	BAL-12.5
	Plot 2 Class D Scrub	Flat	37m	0m	BAL-12.5
	Plot 4 Class G Grassland	Flat	39m in Road Reserve	0m	BAL-12.5
South	Plot 3 Class A Forest south of Armadale Road	Flat	54m Armadale Road	0 m	BAL-12.5
	Plot 3 Class A Forest On site boundary	Flat	15m in Road Reserve	6 m internal lot setback	BAL-29
	Plot 1 Class B Woodland	Flat	54m Armadale Road	0m	BAL-12.5
North – west	Plot 4 Class G Grassland	Flat	20 m Anstey Road	0 m	BAL-12.5
	Plot 2 Class D Scrub	Flat		0 m	BAL-19
	Plot 1 Class B Woodland	Flat		0 m	BAL-19



Location details: Anstey Road, Anstey East Forrestdale
 Assessment date: July, 2017
 Prepared by: Bushfire Safety Consulting
 Accreditation level: Level 3 BPAD Practitioner
 Accreditation number: BPAD 23160
 Accreditation expiry date: 31st January, 2021
 Date aerial photo: May 2020

FIGURE 5 BAL CONTOUR MAP

0 50 100 150 200m
 SCALE 1:5000 @ A3
 DATE: JULY 2020



LEGEND

- SUBJECT LAND
- ASSESSMENT AREA (150m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE
- ASSESSMENT AREA (100m) FROM THE EXTERNAL BOUNDARY OF THE SUBJECT SITE

SOURCE OF PHOTOGRAPHY: NEARMAP

INDICATIVE BUSHFIRE ATTACK LEVELS

- BAL LOW
- BAL 12.5
- BAL 19
- BAL 29
- BAL 40
- BAL FLAME ZONE

5 IDENTIFICATION OF BUSHFIRE HAZARD ISSUES

Temporary and some permanent bushfire threat exists to varying levels right around the site and, as adjacent developments are constructed, the threat will continue to reduce. The LSP proposes a large urban development and this will mean much of the site is beyond 100 metres of classified vegetation once completed. The interface with bushfire hazard will be managed during subdivision stages. The proposed road works on the eastern interface are likely to accompany the development of this site and this will reduce hazard on the eastern interface and improve vehicular access.

The LSP responses to the bushfire threat will comply with SPP 3.7 and the *Guidelines for Planning in Bushfire Prone Areas V1.3(2017)* based on the establishment of Asset Protection Zones based on road reservation, managed POS areas, internal lot setbacks if needed, and a reticulated water supply.

6 ASSESSMENT AGAINST THE BUSHFIRE PROTECTION CRITERIA

This report adopts an acceptable solution and performance-based system of control for each bushfire protection criteria. This methodology is consistent with Appendix 4 of the *Guidelines for Planning in Bushfire Prone Areas, Version 1.3 (2017)*. The management issues are:

- Location of the development
- Siting and Design of Development
- Vehicular access.
- Water

6.1 Compliance Table

Acceptable solutions are proposed for all of the bushfire protection criteria and each illustrates a means of satisfactorily meeting the corresponding performance criteria. Land use planning bushfire risk mitigation strategies are comprehensively detailed in the following sections by providing responses to the performance criteria that fulfil the intent of the bushfire hazard management issues outlined in the *Guidelines for Planning in Bushfire Prone Areas V1.3 (2017)*. The compliance checklist is attached as Table 4 and spatial representation of the bushfire management strategies are illustrated in Figure 6.

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestdale

Table 4: Compliance Table

Bushfire Protection Criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable Solutions	
Element 1: Location	A1.1 Development Location	The Method 1 BAL Assessment outlined in this report demonstrates that all proposed residential areas can accommodate dwellings that are exposed to BAL-29 or lower. With the major road works proposed on the eastern interface undertaken, the exposure of lots will reduce further. Each subdivision stage will need to comply with all bushfire protection criteria.
Element 2: siting and Design	A2.1 Asset Protection Zone (APZ)	The Asset Protection Zone (APZ) will be established over all interface roads between the development site and areas of bushfire hazard (Figure 6). The POS areas will be landscaped to managed parkland standards so they will not pose a bushfire threat (see Section 2.2).
Element 3: Vehicular Access	A3.1 Two access routes	The site is bordered by public roads and there are ten proposed intersections with these existing public roads. A minimum of two access ways will be provided at all subdivision stages.
	A3.2 Public Road	Existing public roads and proposed roads comply with minimum public road standards outlined in Appendix 2.
	A3.3 Cul-de-sac	There is one 60 metre cul-de-sac proposed and it will comply with the standards outlined in Appendix 2.
	A3.4 Battle-axe	There are no battle axes proposed.
	A3.5 Private driveway longer than 50 metres	There are no private driveways longer than 50m proposed.
	A3.6 Emergency access way	There are no emergency access ways proposed.
	A3.7 Fire Emergency access routes	There are no fire emergency access ways proposed.
	A3.8 Firebreak width	Compliance is achieved with the current City of Armadale Firebreak Notice (Appendix 3).

Bushfire Management Plan – Local Structure Plan, Anstey Road, Forrestdale

Element 4: Water	A4.1 Reticulated areas	The development has access to a reticulated water supply. Hydrants will be spaced according to the Water Corporation’s No. 63 Water Reticulation Standard. For future developments like the school, as required by Regulation 18B (1) of the amended (19 Dec 2012) Building Regulations 2012, the application for the building permit for a Class 2-9 building is required to have plans and specifications of sufficient detail for assessment purposes deposited with DFES. This documentation will be provided to DFES for assessment specific to the proposed development at the time of building license application.
	A4.2 Non-reticulated areas	Not applicable
	A4.3 Individual lots within non-reticulated areas	Not applicable

6.2 Additional Management Strategies

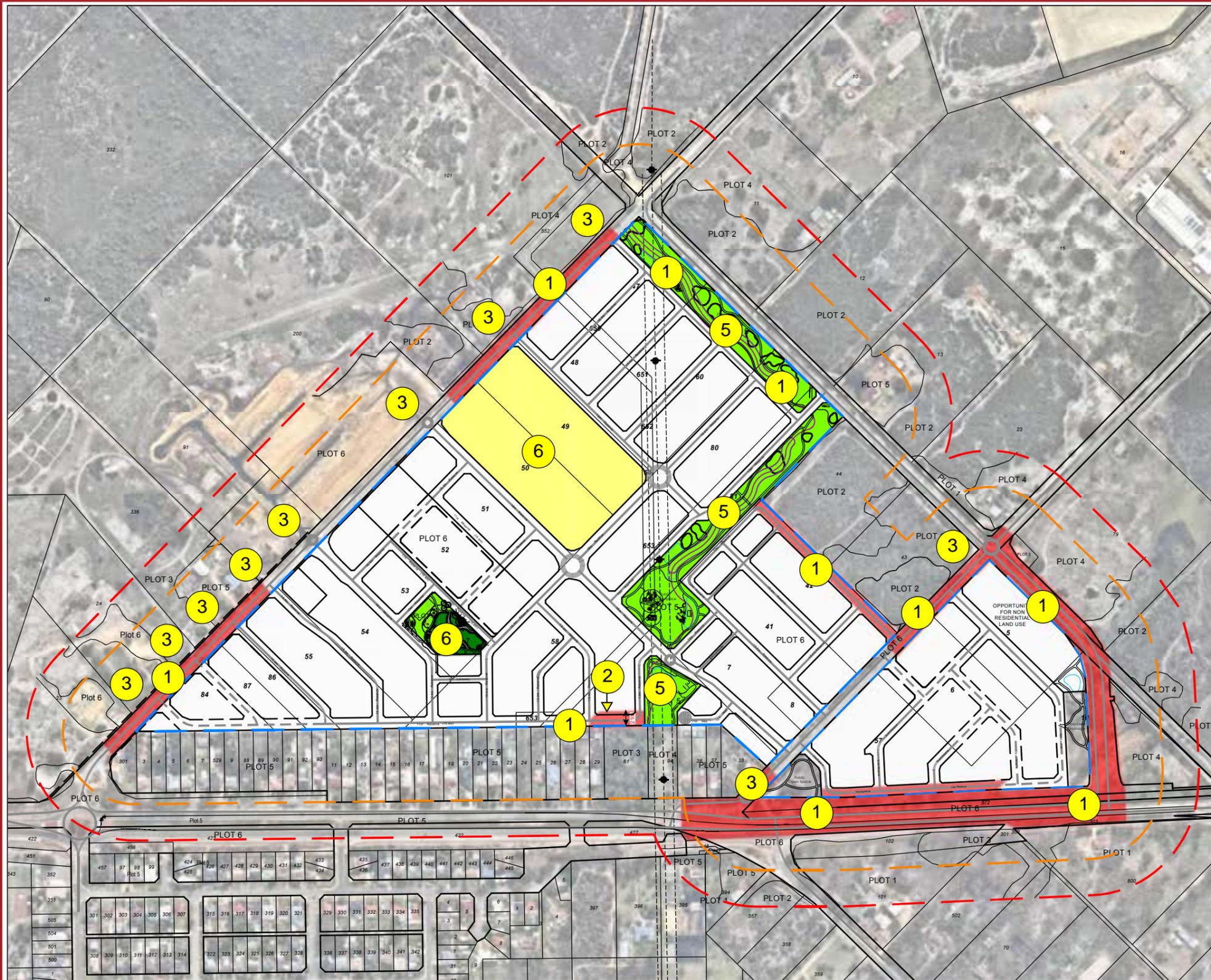
The site will be developed in stages and APZ standards will be required for a minimum 100 metre buffer around each stage to ensure temporary hazards do not pose a threat during the staging of the site.

A summary of management strategies is outlined in Figure 6.

APZ standards within the site will be maintained by the developer at all stages of the development, including prior to the creation of titles until the sale of lots.

A primary school, which is a vulnerable land use, is proposed at the site. When a development application is lodged it will need to be accompanied by a Bushfire Management and Emergency Evacuation Plan in order to meet the requirements under State Planning Policy 3.7.

A summary of management strategies is outlined in Figure 6.



REQUIREMENTS

1. The perimeter Asset Protection Zones (APZs) occupy the adjacent road reserves to the south-west, north-west, and south-east, as well as on internal roads on the north-east and southern boundaries. It also incorporates the POS within the site along the north-east boundary, as shown.
2. A 7 metre internal lot APZ is required adjacent to the perimeter road on the southern boundary to create a 21m setback from a small area of nearby Class A Forest. This can easily be accommodated in the front lot setback.
3. Three major public roads provide 10 access points into and out of the site in three different directions, west, north-east and south.
4. The area is provided with reticulated water supply. The provision of scheme water along with fire hydrants will meet the specifications of Water Corporation Design Standards 63 and DFES requirements.
5. Public Open Space areas will be landscaped. The living stream corridor will be a managed and maintained public reserve. The corridor will require permanent ongoing management in order to function both as a useable POS for recreation and for its stormwater drainage function. POS management will include;
 - Standard weed management, including regenerating Eucalypts, Wattles etc that are not part of the landscape plan (herbicide application and hand removal as required).
 - Removal of fine fuels (leaf litter, twigs etc).
 - Tree pruning for safety and amenity (including under-pruning to remove lower branches to 2 metres from ground level).
 - Removal of dead and diseased plants
 - Pruning to maintain shrub separation.
 - Mulch top-ups and rubbish removal.
6. A small area of remnant vegetation will be retained in the POS to the south-west of the site. This vegetation is classified as low threat (Exclusion Clause 2.2.3.2 (b)) as it is less than 1 hectare in size and is more than 100 metres from other classified vegetation.
7. The future school will need to lodge a Development Application at which time an updated Bushfire Management Plan is likely to be required to support the proposal.

LEGEND:

- Asset Protection Zone
- Highly managed POS reserves
- Roads
- School site



SCALE 1:6000 @ A3
DATE: JULY 2020



Location details: Anstey Road, Anstey East Forrestdale
Assessment date: July, 2017
Prepared by: Bushfire Safety Consulting
Accreditation level: Level 3 BPAD Practitioner
Accreditation number: BPAD 23160
Accreditation expiry date: 31st January, 2021
Date aerial photo: May 2020

FIGURE 6 - SPATIAL REPRESENTATION OF BUSHFIRE MANAGEMENT STRATEGIES

7 RESPONSIBILITIES FOR IMPLEMENTATION AND MANAGEMENT OF THE BUSHFIRE MEASURES

Table 5 outlines the initial and ongoing responsibilities, actions and associated works that need to be undertaken by the Developer, future landowners and the City of Armadale. Check boxes for implementation actions will be used for subdivision clearance at that stage of development. Similarly, a Bushfire Planning Practitioner will certify the BAL ratings are correct and necessary implementation actions have been completed.

Table 5. Responsibility for bushfire measures

DEVELOPER / PROPONENT / LANDOWNER	
SUBDIVISION STAGE AND ONGOING MANAGEMENT	
1	At Subdivision stage, update the Bushfire Management Plan to demonstrate full compliance with relevant sections of SPP 3.7 and the Guidelines for Planning in Bushfire Prone Areas.
2	At subdivision stage, ensure water supply, vehicular access standards, and internal APZs are established.
3	At subdivision stage, ensure grass fuels are maintained below 100mm in length within the 100m internal buffer and other areas of classified vegetation are maintained to Exclusion Clause 2.2.3.2 levels with fuel load management strategies.
4	At subdivision stage, establish and maintain road reserves and POS areas in low threat condition as per Section 2.2 until sale of lots and handover to City of Armadale.
5	At subdivision stage, assess and confirm the BAL ratings for individual lots prior to the creation of titles.
6	Ensure the site complies with the current City of Armadale’s Firebreak Notice as published.
7	Ensure any future construction of buildings comply with AS 3959:2018 as and when required.
8	Update the Bushfire Management Plan as requested by the City of Armadale if it has reason to believe site conditions have substantially changed, or new methodologies or practice are adopted as identified in future revisions of the “Guidelines”.

CITY OF ARMADALE – ONGOING MANAGEMENT	
9	Maintain public roads to appropriate standards and ensure compliance with the current City of Armadale’s Firebreak Notice.
10	Maintain road reserves and POS areas in low threat condition as per Section 2.2 after handover from developer.
11	Provide fire prevention and preparedness advice to landowners upon request, including the <i>Homeowners Bush Fire Survival Manual, Prepare, Act, Survive</i> (or similar suitable documentation) and the current City of Armadale’s Firebreak Notice.

8 CONCLUSION

This Plan provides acceptable solutions and responses to the performance criteria that fulfil the intent of the bushfire hazard management issues outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC 2017 V1.3). However, community bushfire safety is a shared responsibility between governments, fire agencies, communities and individuals.

The LSP is located in the bushfire prone area (i.e. within 100 m of classified vegetation) and risk is reduced via compliance with *AS 3959:2018* standards.

Future dwellings will be exposed to < 29kW/m² and achieves BAL-29. A minimum of two vehicular access options is achieved, and fire hydrant requirements for fire-fighting will be met. The LSP and proposed development will fall within the acceptable level of risk.

REFERENCES

Department of Fire and Emergency Services (DFES), 2014. *The Home Owner's Bushfire Survival Manual*. https://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/BushfireManualsandGuides/DFES_Bushfire-Homeowners_Survival_Manual.pdf Department of Fire and Emergency Services, Government of Western Australia.

Standards Australia, 2018. *Construction of buildings in bushfire-prone areas (Amendments 1-3)*, AS 3959-2018, Standards Australia International Ltd, Sydney.

Western Australian Planning Commission (WAPC), 2015. *State Planning Policy No. 3.7: Planning in Bushfire Prone Areas (SPP3.7)*. December 2015. Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.

Western Australian Planning Commission (WAPC), 2017. *Guidelines for Planning in Bushfire Prone Areas*. December 2017 V1.3. Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.



APPENDICES

- Appendix 1: Asset Protection Standards
- Appendix 2: Vehicular Access Technical Requirements
- Appendix 3: City of Armadale Firebreak Notice 2019-20
- Appendix 4: Landscape Masterplan

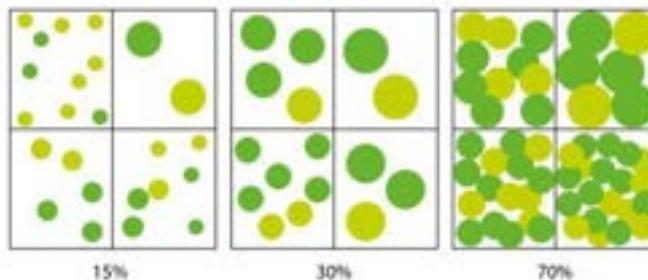
Appendix 1: Asset Protection Standards

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

SCHEDULE 1: STANDARDS FOR ASSET PROTECTION ZONES

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (> 5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.

Figure 18: Tree canopy cover – ranging from 15 to 70 per cent at maturity

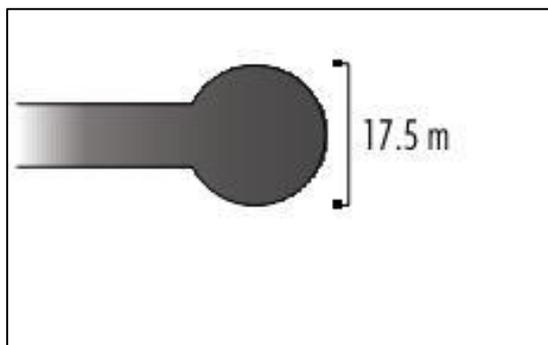


- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Appendix 2: Vehicular Access Technical Requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5

*Refer to E3.2 Public roads: Trafficable surface



Appendix 3: City of Armadale Firebreak Notice 2019-20

FIREBREAK NOTICE



CITY OF Armadale

7 Orchard Avenue, Armadale
Western Australia 6112

Locked Bag No 2, Armadale
Western Australia 6992

www.armadale.wa.gov.au

ABN: 79 863 269 538

For updated information on alerts and warnings about fires, floods, storms, earthquakes, cyclones, hazardous material incidents and more visit

www.emergency.wa.gov.au

DFES 1300 657 209

www.dfes.wa.gov.au

Western Australian
Bureau of Meteorology 1196

City of Armadale Rangers
9394 5000

After Hours 1300 886 885

To obtain a fire permit
9394 5000

IN ALL EMERGENCIES CALL 000
FIRE AMBULANCE POLICE

Date: 5 August 2019

NOTICE TO ALL OWNERS AND OCCUPIERS OF LAND WITHIN THE CITY OF ARMADALE

BUSH FIRES ACT 1954

Pursuant to the powers contained in Section 33 of the *Bush Fires Act 1954*, you are hereby required on or before the 30th day of November 2019 or within fourteen days of you becoming the owner or occupier of land should this be after the 30th day of November 2019 to clear firebreaks and remove flammable materials from the land owned or occupied by you as specified hereunder and to maintain the specified land and firebreaks clear of all flammable materials up to and including the 31st day of March 2020.

Definitions

FIREBREAK means plough, cultivate, scarify, burn or otherwise clear upon the land firebreaks in such manner, at such places, of such dimensions, and to such number, and whether in parallel or otherwise, as the local government may and is hereby empowered to determine and as are specified in the notice, and thereafter to maintain the firebreaks clear of inflammable matter – Section 33(a) of the *Bush Fires Act 1954*.

FLAMMABLE means any bush, plant, tree, grass, mineral, vegetable, substance, object, thing or material that may, or is likely to, catch fire and burn.

TRAFFICABLE means to be able to travel from one point to another in a 4x4 fire vehicle on a firm and stable surface, unhindered without any obstruction or getting stuck, bogged or trapped.

VERTICAL AXIS means a continuous vertical uninterrupted line at a right angle to the horizontal line of the firebreak.

All Areas of Land over 5000m²

Install and maintain a minimum three (3) metres wide by four (4) metres high clearance, bare mineral earth, trafficable (refer to definition) firebreak no more than 10 metres from the property boundary for the entire perimeter of that property. A reticulated and maintained green lawn may be accepted in lieu of a firebreak.

The firebreak must be a minimum of three (3) metres wide to accommodate for the width of emergency vehicles and have a minimum height clearance of four (4) metres to allow for the height of emergency vehicles.

Bare, mineral earth is essential for the safety and effectiveness of all firebreaks and is considered a safe passage for emergency vehicles to travel along. If a firebreak contains combustible material, it could potentially set vehicles alight and facilitate the growth of a fire.

Install bare mineral earth trafficable firebreaks to a minimum of three (3) metres wide immediately surrounding all buildings, sheds and haystacks or groups of buildings situated on that land, with all overhanging branches, trees, limbs etc. to be trimmed back to three (3) metres high with a clear vertical axis over firebreak area. This includes driveways and access to all buildings on the land.

All Areas of Land less than 5000m²

Have all flammable matter except living trees, shrubs and plants under cultivation, slashed, mowed or trimmed down by other means to a height no greater than five (5)cms across the entire property. This includes slashing between parkland, includes weeds, all grasses and hay.

Shrubs are to be trimmed back over driveways and access ways to all buildings to three (3) metres wide with a clear vertical axis over it four (4) metres high to afford access for emergency vehicles to all structures and points of the property.

Hazard Reduction

In addition to the provisions of this notice you may be required to carry out further works which are considered necessary by Council or an Authorised Officer of the City and specified by way of a separate written notice forwarded to the address as shown on the City of Armadale rates record for the relevant land.

Application to Vary Firebreak Requirements

Note: No firebreak exemptions will be given. Please apply for a firebreak variation if an alternative location for firebreak installation is required.

If it is considered impracticable for any reason whatsoever to clear firebreaks or establish other arrangements as required by this notice, you may apply in writing to the City of Armadale, or its duly Authorised Officers, **no later than the 1st day of October 2019** for permission to provide firebreaks in alternative positions on the land. If permission is not granted by the City or its duly Authorised Officers you must comply with the requirements of this notice.

In some instances naturally occurring features such as rocky outcrops, natural watercourses or landscaping such as reticulated gardens, lawns or driveways may be an acceptable substitute for cleared firebreaks.

All firebreaks and other alternative arrangements allowed by the preceding parts of this notice must be established on or before the 30th day of November 2019 (or within 14 days of you becoming the owner or occupier should this occur after that date) and remain clear of flammable material up to and including the 31st day of March 2020.

All approved firebreak variations must be installed as close to the property boundary as practicable.

Fuel Storage

On all land where fuel drum ramps are located and where fuel dumps, whether containing fuel or not, are stored, clear maintained firebreaks three (3) metres wide with a clear vertical axis over it of four (4) metres in height, around any drum, ramp or stack of drums.

Penalties

The penalty for failing to comply with this notice is a fine not exceeding \$5000 and a person in default is also liable whether prosecuted or not to pay the costs of performing the work directed by this notice if it is not carried out by the owner and/or occupier by the date required by this notice.

By order of the City of Armadale
Cliff Frewing - Chief Executive Officer



Appendix 4: Landscape Masterplan

