

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Lot 3 Warnbro Sound Ave

Suburb: Warnbro

State: WA

P/code: 6169

Local government area: City of Rockingham

Description of the planning proposal: Residential subdivision

BMP Plan / Reference Number:

Version: 2.1

Date of Issue: 15/07/2020

Client / Business Name: Peet Ltd and Department of Communities (Housing)

Reason for referral to DFES	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Is the proposal any of the following special development types (see SPP 3.7 for definitions)?		
Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the development is a special development type as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

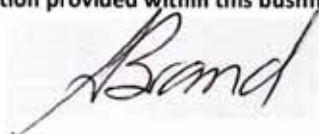
Note: The decision maker (e.g. local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Sue Brand	2	36638	30 April 2021
Company		Contact No.	
Natural Area Consulting Management Services		0439 435 110	

I declare that the information provided within this bushfire management plan is to the best of my knowledge true and correct

Signature of Practitioner



Date 15/07/2020



Natural Area
CONSULTING MANAGEMENT SERVICES

Peet Ltd and Department of Communities (Housing)

Bushfire Management Plan Lot 3 Warnbro Sound Ave, Golden Bay

V2.1 – 15 July 2020

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Disclaimer

Natural Area Holdings Pty Ltd, trading as Natural Area Consulting Management Services (Natural Area), has prepared this Bushfire Management Plan for use by:

- Peet Ltd
- Department of Communities (Housing)
- City of Rockingham
- Purchasers of Lots.

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Document Control

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Location	Client Folders NAC/Peet Ltd/Golden Bay/Golden Bay - BMP Lot 3/Lot 3 BMP Update June 2020/Report/				
Version No.	Date	Changes	Prepared by	Approved by	Status
D1	09 Nov 2016	New Document	SB	LS	Draft for client comment
D2	11 Nov 2016	Incorporate client comments	SB	LS	Draft for client comment
V1	07 March 2017	CoR comments	SB	LS	Superseded
V1.1	17 March 2017	Minor adjustments	SB	LS	Superseded
V1.2	21 March 2017	Minor adjustments	SB	LS	Superseded
V1.3	22 March 2017	T2, minor adjustments	SB	LS	Superseded
V1.4	10 April 2017	Minor adjustments	SB	LS	Superseded
V1.5	17 Dec 2018	Lot 3 Compilation	SB	LS	Superseded
V1.6	18 January 2019	Implementation, roles, responsibilities	SB	LS	Superseded
V1.7	11 July 2019	Incorporate DFES comments	SB	SH	Superseded
V1.8	29 August 2019	Landscape plan	SB	SH	Superseded
V1.9	30 October 2019	Landscape plan, text	SB	SH	Superseded
V2.0	25 June 2020	Stage 5C detail, WAPC adjustments	SB	SB	Superseded
V2.1	15 July 2020	Minor adjustments	SB	SB	Final

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1.0 Background Information

Peet Golden Bay Ltd commissioned Natural Area Holdings Pty Ltd, trading as Natural Area Consulting Management Services (Natural Area) to update the 2012 Fire Management Plan (FMP) for Lot 3 Warnbro Sound Ave, Golden Bay within the City of Rockingham to give effect to the provisions of *SPP 3.7 Planning in Bushfire Prone Areas* (Department of Planning and the Western Australian Planning Commission, 2015) and *Guidelines for Planning in Bushfire Prone Areas* (Department of Planning, Western Australian Planning Commission and Department of Fire and Emergency Services, 2017). The broad aim of the assessment process associated with preparation of the plan was to identify potential bush fire risks to future properties and their management when the site is developed. This document compiles the various assessments that have been carried out for the approved subdivision area (northern portion of the site) and the remainder of Lot 3 (southern portion of the site) that have been carried out since 2017.

1.1 Location

The site is located approximately 55 km south west of the Perth Central Business District and covers approximately 39 ha. The area is bounded by vegetated land in private ownership to the east, Dampier Road and Warnbro Sound Avenue to the north, Minderoo Crescent to the west and Blue Fin Drive to the south (Figure 1). Note that Lot 3 is one of two sites being developed by Peet Limited on behalf of the Department of Communities (Housing), with the development of Lot 2 Warnbro Sound Avenue to the east well advanced.

1.2 Aims and Objectives

The aim of the Bushfire Management Plan (BMP) is to outline the fire management methods and requirements that will be implemented within the proposed subdivision. Accordingly, broad aims include:

- reduce the occurrence of, and minimise the impact of fire to the life and property of future residents and the environment
- allow easy access of fire-fighters if a fire does occur
- protect the landscape within the site as far as is possible
- document fire prevention requirements of the area to which it relates.

The objectives of this Bushfire Management Plan are to:

- define land use areas and values within the subdivision, with the entire subdivision being developed as urban residential Lots except for the landscape protection area and various locations designation public open space
- define and rank fire hazard areas according to the vegetation type and fire fuels present
- outline the roles and responsibilities of individuals and organisations in relation to fire management within the subdivision
- document fire management strategies for the subdivision, taking into consideration:
 - vegetation to be retained in the public open space area
 - the need for building construction standards where vegetated areas interface with the urban development
 - identify access for fire-fighting operations and daily maintenance in an around vegetated areas and stages of development

- define an assessment procedure that will evaluate the effectiveness and impact of existing and proposed fire prevention activities and strategies
- document the performance criteria and acceptable solutions adopted for the site.

1.3 Document Preparation

Sue Brand, an accredited Level 2 BPAD practitioner with the Fire Protection Association Australia.

Activities involved with the plan preparation process included:

- assessing the vegetation type and class present within and adjacent to the proposed development site using descriptions provided in *AS 3959 – 2018 Construction of Buildings in Bushfire Prone Areas*
- assigning hazard ratings based on the vegetation types present on and offsite
- determining BAL ratings and suggesting management strategies that could be implemented based on current and projected site considerations
- preparing the management plan.

1.4 Compliance Statement

This Bushfire Management Plan has been prepared in accordance with the requirements of *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (Department of Planning and Western Australian Planning Commission, 2015) and *Guidelines for Planning in Bushfire Prone Areas* (Department of Planning, Department of Fire and Emergency Services and Western Australian Planning Commission, V1.3, 2017).



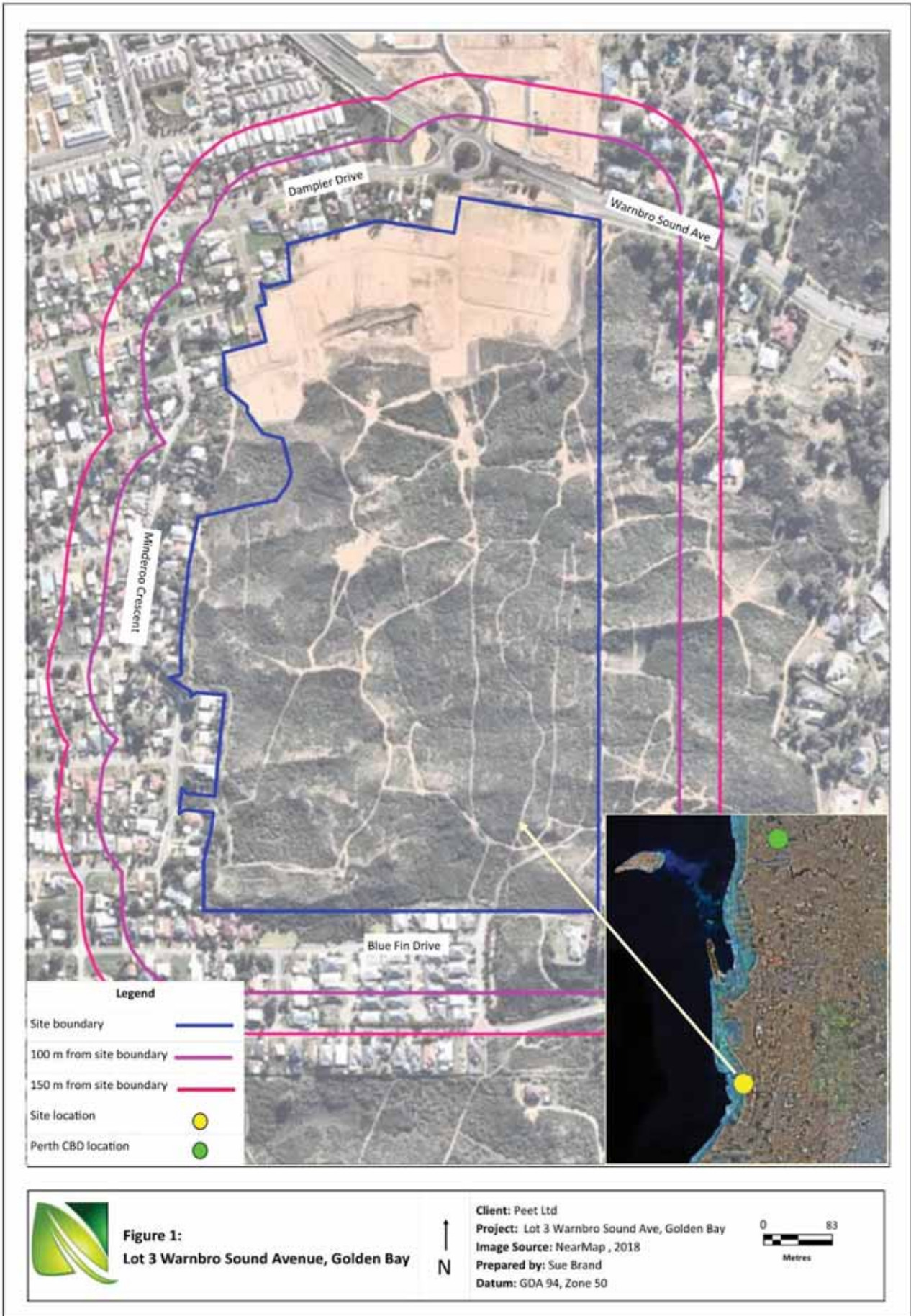
Signed:

Date: 15 July 2020

Accreditation Number: 36638

Accreditation Expiry Date: 30 April 2021





2.0 Consideration of Bushfire Threat

2.1 Site Characteristics

2.1.1 Regional Context

Perth is located within the Swan Coastal Plain region of the Interim Biogeographical Regionalisation of Australia (IBRA). The Swan Coastal Plain comprises of two major divisions, namely Swan Coastal Plain 1 – Dandaragan Plateau and Swan Coastal Plain 2 – Perth Coastal Plain. The site is located in the Perth subregion, which is broadly characterised as including areas of Jarrah and Banksia woodlands on sandy soils in a series of sand dunes, along with wetland areas, often within the interdunal swales (Mitchell, Williams and Desmond, 2002).

2.1.2 Vegetation

Lot 3 is currently vegetated with low coastal heath plants typical of coastal dune areas, with some eroded tracks from 4-wheel drive activity also apparent on site. Some of the vegetation present will be cleared to accommodate the subdivision when it proceeds.

2.1.3 Contours and Slope

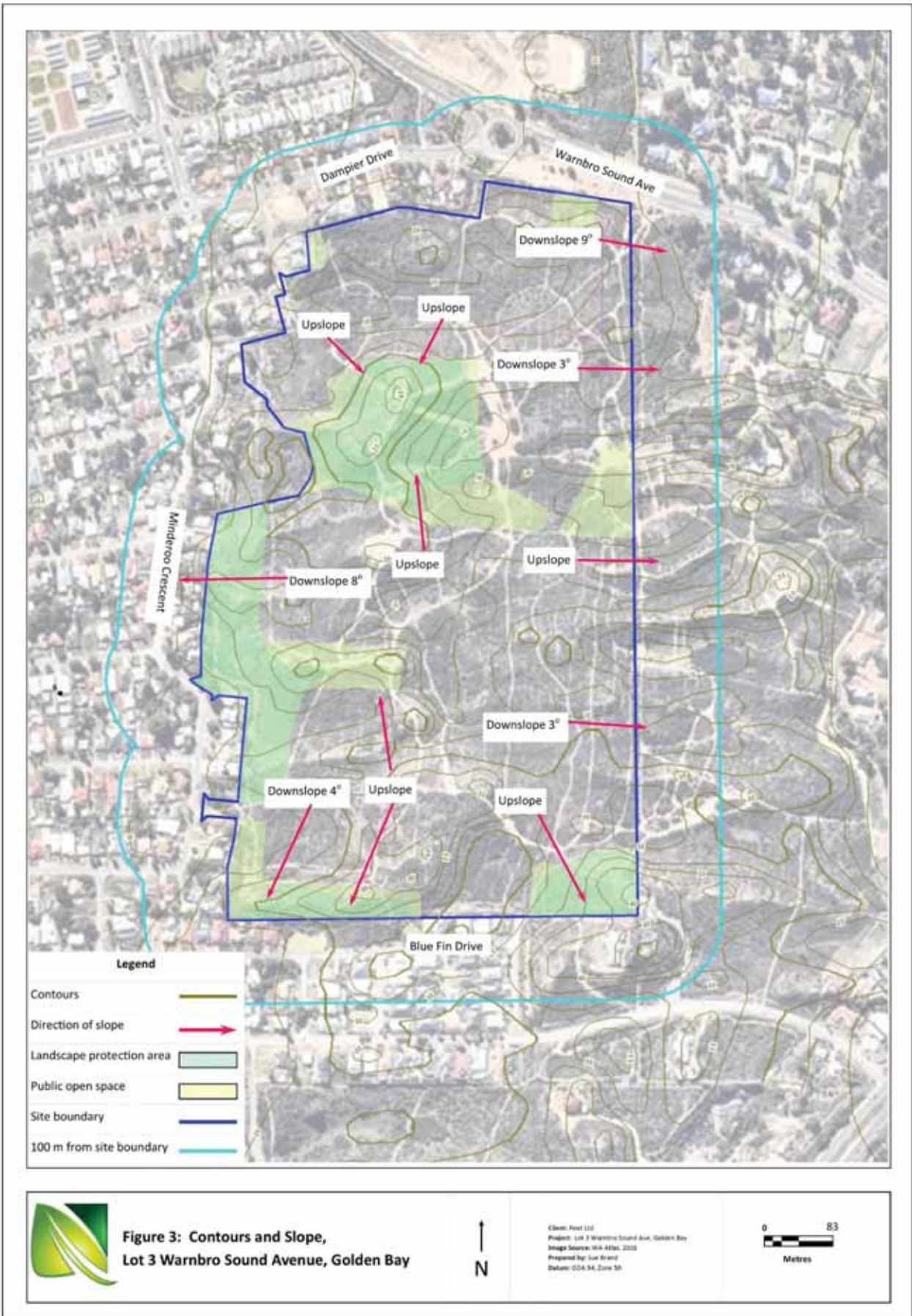
The site is characterised by a series of aeolian parabolic sand dunes that are situated approximately parallel to the current coastline, with heights ranging from 10 m AHD up to 35-to-40 m AHD. Slopes are variable due to the presence of the sand dunes and ranges from upslope to a maximum of 9.5° downslope (Figure 3).

2.1.4 Land Use

The land is currently vacant with some fencing the only asset present (Figure 2).



Figure 2: Land-use – Lot 3 Warnbro Sound Ave, Golden Bay



2.1.5 Climate

The climate experienced in the area is Mediterranean, with dry, hot summers and cool, wet winters. The Bureau of Meteorology (2016) describes the climate at the Perth Airport (Station 009021) as:

- average rainfall is 771.6 mm pa, with the majority falling between May and August
- average maximum temperature ranges from 17.9 °C in winter to 31.9 °C in summer, with the highest recorded maximum being 46.7 °C
- average minimum temperatures range from 8.0 °C in winter to 17.5 °C in summer, with the lowest recorded minimum being -1.3 °C
- predominant wind directions include morning easterlies followed by south-westerly sea breezes during summer months when the risk of fire is greatest (Figure 4). The average wind speed is 23.8 km/h with gusts of more than 100 km/h possible, particularly during storm events.



Figure 4: Average January wind direction, Perth Airport
Source: Bureau of Meteorology, 2018

2.2 Vegetation Classification

Vegetation on and within 100 m of the site was assessed during an initial visit on 08 June 2016 using descriptions provided in Table 2.3 and Figure 2.4 of AS 3959 – 2018 (Figure 10); the most recent visit to the site occurred on 14 September 2018. Each vegetation class is discussed separately. A post-development vegetation classification diagram has been prepared to provide an indication of the maximum level of vegetation that will be retained in the longer term (Figure 11); note that the final extent is subject to additional landscape design and site survey as a minimum.

2.2.1 Area 1: Class C Shrubland

The dominant vegetated type on Lot 3 is Class C Shrubland which is less than 2 m high (Figure 5). This vegetation is present in its mature state, with this status confirmed from regular visits to the site since 2011. Some will be retained in the landscape protection and public open space areas, while most will be cleared to accommodate the development.

Area:	1	Classification or Exclusion Clause:	Class C Shrubland (< 2 m high)
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Photo ID: 1



Photo ID: 2



Photo ID: 3

Figure 5: Class C Shrubland, Lot 3 Warnbro Sound Ave, Golden Bay

2.2.2 Area 2: Class D Scrub

Patches of Class D Scrub (> 2 m) high are present in Lot 3 (Figure 6). Some of this vegetation type will be retained in the landscape protection areas while some will be cleared.

Area:	2	Classification or Exclusion Clause:	Class D Scrub (> 2 m high)
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Photo ID: 4



Photo ID: 5

Figure 6: Class D Scrub, Lot 3 Warnbro Sound Ave, Golden Bay

2.2.3 Area 3: Class B Woodland

A small patch of Class B Woodland is present approximately outside the development site but within 100 m of the Lot 3 boundary to the north east, where the vegetation begins to transition from coastal heath to trees associated with banksia/jarraah woodlands on the Swan Coastal Plain (Figure 7). This patch is located a minimum of 50 m from the Lot 3 boundary on a private rural residential property and is not extensive in size. Based on that distance, the vegetation type that will determine the BAL-rating in this area is the Class C Shrubland.


Area:	3	Classification or Exclusion Clause:	Class B Woodland
			

Photo ID: 6

Figure 7: Class B Woodland north of Lot 3 Warnbro Sound Ave, Golden Bay

2.2.4 Area 4: Low-threat Vegetation

Low threat vegetation is present to the north in the rural residential development across Dampier Drive to the north (Figure 8). Low-threat vegetation will be created in some of the POS areas within the development area, with indicative landscape designs provided in Appendix 1. Areas of low-threat vegetation are subject to exclusion clause 2.2.3.2 (f) of AS 3959 – 2018.

Area:	4	Classification or Exclusion Clause:	Exclusion clause 2.2.3.2 (f)
			

Photo ID: 7

Figure 8: Low threat vegetation – rural residential Lots

2.2.5 Area 5: Non-vegetated Areas

Clearing has commenced within the northern portion of Lot 3 and various locations outside the Lot 3 boundary but within 100 m of the site are developed as residential housing, roads and associated infrastructure (Figure 9); these areas are subject to exclusion clause 2.2.3.2 (e) of AS 3959 – 2018.

Area:	5	Classificaiton or Exclusion Clause:	Exclusion clause 2.2.3.2 (e)
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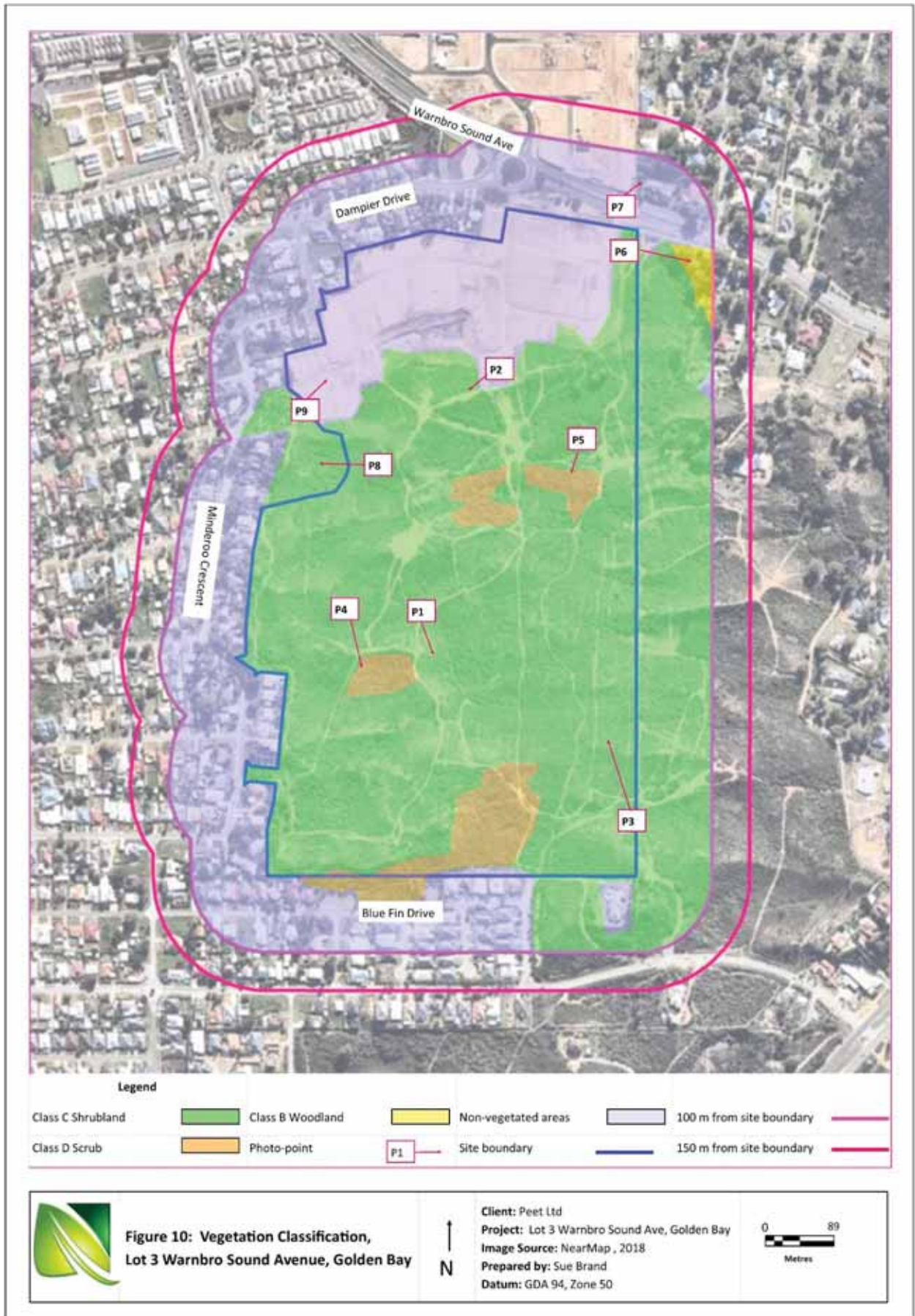


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Photo ID: 9

Figure 9: Cleared areas in the northern portion of Lot 3 and residential development close by





2.3 Bushfire Hazard Level

2.3.1 Fire History

Several small, minor scrub fires have occurred at the site over time. Larger fires include one near Minderoo Crescent around 2004 – 2005, one to the east towards Mandurah Road in 2010, and one in the foreshore reserve near Lot 2 Warnbro Sound Ave in January 2016.

2.3.2 Bushfire Hazard Assessment

Depending on the vegetation type, a hazard rating of low, moderate or high is assigned. The nature of the vegetation in and around Lot 3 Warnbro Sound Avenue means that the pre-development bushfire hazard rating is primarily moderate due to the Class C Shrubland being the dominant vegetation present, with the pockets of Class D Scrub having an extreme hazard rating (Figure 12). All locations within 100 m of the site are shown as having a moderate hazard due to the increased risk levels. As development proceeds over time, the hazard rating within portions of the site will decrease.

2.3.3 Bushfire Fuels

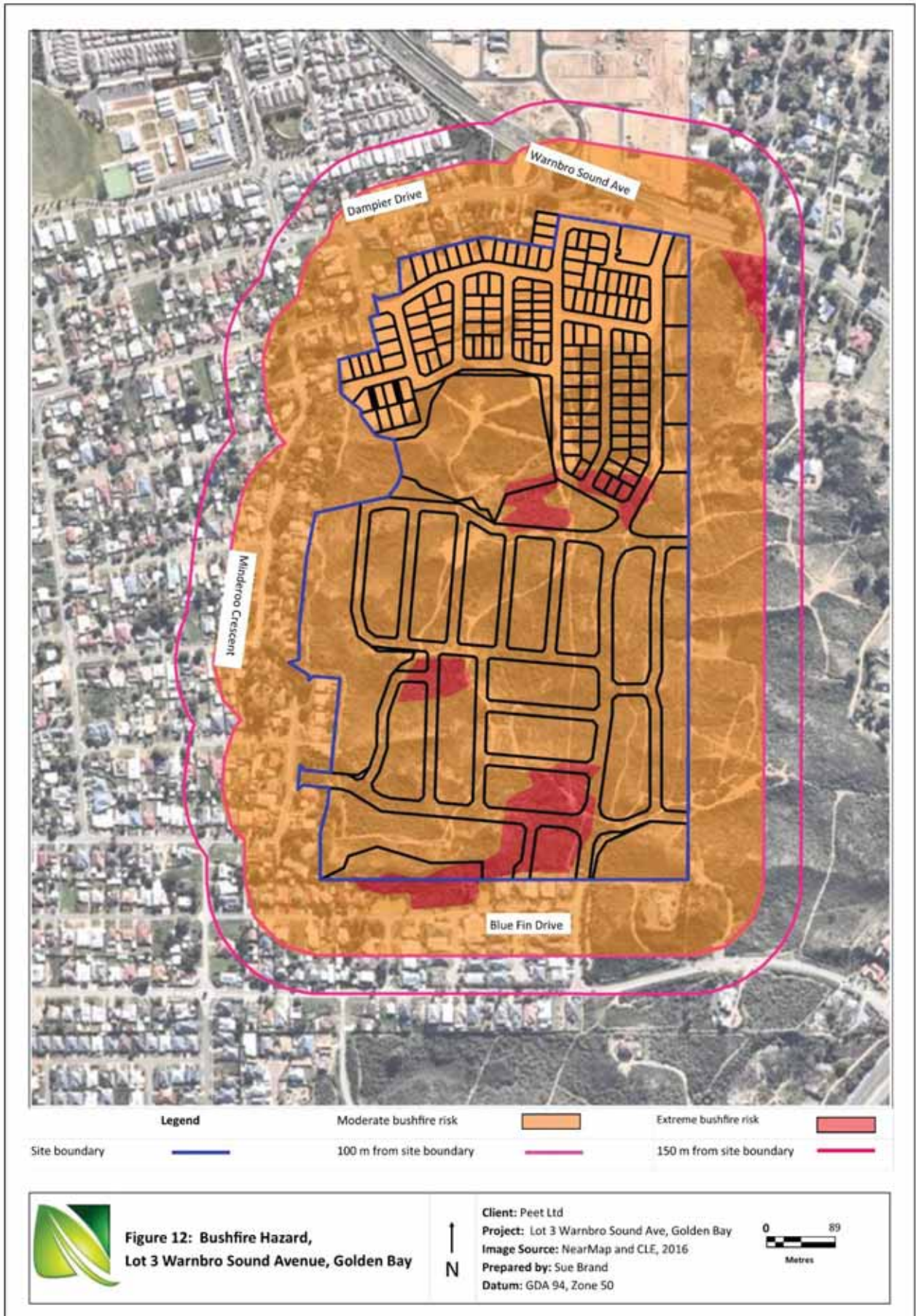
Bushfire fuels are present in the Class C Shrubland and Class D Scrub within Lot 3, and in vegetated areas to the east and south. At some future point in time, the fuel load in each of these locations will change through various mechanisms, such as subdivision works (Lot 3).

2.3.4 Fire Danger Index (FDI)

The fire danger index for this site is FDI 80, as documented in Table 2.4.3 of AS 3959 and which is the nominated FDI for Western Australia.

2.3.5 Potential Fire Impacts

Potential fire impacts within Lot 3 include smoke, ember attack and radiant heat.



2.4 BAL-Assessment

The BAL-assessment has been carried out for all of Lot 3, with the northern portion (approved subdivision area) having the Lot layout known. The southern portion (remainder Lot 3) has an indicative design for the majority of the site, other than those Lots within Stage 5C, thus BAL-contours represent the current level of knowledge and will be refined as the Lot layout is refined. A worst-case scenario approach has been adopted, with BAL-contours measured from the edge of proposed roads, cleared areas, and Lot boundaries; adjustments to BAL-contours will occur for some locations as clearing and landscaping progresses.

2.4.1 Approved Subdivision Area – Northern Portion of the Site

The BAL-assessment for the approved subdivision area in the northern portion of Lot 3 is based on a known design. Where known, Lot numbers are provided, with arbitrary labels for those Lots yet to be assigned a number. The major influence on the BAL-ratings is the vegetated land in private ownership to the east and the landscape protection area to the south. The BAL-contours for Lot 3 are shown in Figure 13, with detail on BAL-ratings for the approved subdivision area shown in Figures 14 – 17 and detail provided in Table 1.

Reserves S1, S2 and P1

Reserves S1, S2 and P1 in the northern portion of the site are landscape spaces and drainage reserves that will be landscaped and maintained in a low fuel condition, which is consistent with the approved landscape masterplan prepared by EPCAD in 2020 (Figure 18). As subdivision approval has been issued for this northern area, it is evidence that the City of Rockingham has accepted that these areas will need to be maintained as low fuel areas in perpetuity. Discussion with the City in relation to the landscape plan has continued, including in principle support provided in August 2019.

Landscape Protection Area

The Landscape Protection Area M is present as a large reserve in the northern portion of the site that includes one of the larger dunes that will be retained in perpetuity. Much of the vegetation associated with the dune will be retained. As present, the BAL-contours have been applied on a worst-case scenario basis assuming the maximum retention of vegetation. It is acknowledged that some landscaping will occur in the area surrounding the landscape protection area, with Figure 18 providing an indication of what could occur. When the landscaping plans are finalised, there will probably be some refinement of separation distances and potentially BAL-ratings on individual Lots within the immediate vicinity of the landscape protection area (Figures 13 and 14).

Reserve N – Lot 4205 Minderoo Crescent

Lot 4205 Minderoo Crescent is a vegetated reserve (N) to the east of Lot 3 managed by the City of Rockingham. Planning associated with Lot 3 has been ongoing for more than 10 years and has including regular consultation and discussion with the City of Rockingham. Accordingly, the vegetation within Lot 4205 has been considered when assessing the bushfire risk within Lot 3. Landscaping is expected in the northern portion of Reserve N that will be maintained as a low-fuel zone as defined by AS 3959 – 2018 (Figure 18) and enable an appropriate separation distance to be achieved for what will become Lots 1620 - 1627. Evidence of acceptance of this approach by the City of Rockingham is the subdivision approval for the northern portion of Lot 3 and continued in principle support of the 2019 landscape plan in August 2019.

At present, BAL-contours in Lots 1620 -1627 east of Lot 4205 are shown based on the worst-case-scenario with no modification of the vegetation. On that basis, Lots 1620 and 1621 appears to be in the BAL-40 or BAL-29 zone, however, discussions with the City in relation to the landscaping are well advanced and suggest an agreement will be reached as to the area that will become a low-fuel zone. It is expected that Lot 1620 will be able to achieve a BAL-12.5 rating, with Lot 1621 a BAL-29 rating; both Lots will be subject to further assessment at a later stage. If landscaping within Lot 4205 does not proceed, alternative fire management options for Lots 1620 and 1621 include assigning a minimum separation distance from building walls and/or a nominated building envelope to achieve the required separation distance. In the interim, the developer has committed to not developing the Lot until such time as the separation distance can be confirmed.

Private Land to the East of Lot 3

Rural residential Lots are proposed along the eastern boundary of Lot 3. This area is directly adjacent to vegetated land in private ownership that is expected to be retained in the immediate future. As the rural residential Lots are a minimum of 2000 m², there is sufficient space within the Lot to assign a building envelope that ensures a suitable separation distance from the vegetation and thus a maximum BAL-rating of BAL-29. Evidence of the acceptability of this approach is the subdivision approval issued for this location.

2.4.2 Remainder of Lot 3

As the final Lot layout for the remainder of Lot 3 (southern portion) has not been finalised other than for Stage 5C, a BAL-contour diagram has been prepared for the indicative lot layout showing likely areas where a BAL-rating will be required, with ratings up to a BAL-29 expected (Figure 13). It is also expected that nominated building envelopes and minimum setback distances from Lot boundaries will be required in some locations to achieve nominated BAL-ratings, such as Lots adjacent to vegetated land to the east. Landscape protection areas and other reserves within this portion of Lot 3 will retain varying amounts of vegetation as per the indicative landscape plan prepared by EPCAD (Figure 18). In the interim, the BAL-contour diagram has been prepared based on the worst-case-scenario approach of maximum vegetation retention (Figure 13).

When the final lot layout is known, the BAL-contours will be reassessed and each Lot that is within 100 m of classified vegetation will be reviewed and refined. Alternative options such as the assigning of a suitable building setback or nominating a building envelope will be explored. Note that the Developer has committed to not developing any Lot that cannot achieve a maximum BAL-29 rating.

Stage 5C South of Landscape Protection Area

In addition to the Stage located in the northern portion of Lot 3, 30 are located south of the landscape protection area. Five Lots will be rated BAL-19 due to their proximity to vegetation within the landscape protection area, 23 will be rated BAL-12.5 and two Lots BAL-Low (Figure 17).

2.4.3 Asset Protection Zone

The asset protection zone for Lots is that area that provides the separation distance between the classified vegetation and building walls. For Lot 3, it generally commences at the junction of the BAL-40 and BAL-29 zones, or the junction of the orange and yellow zones in Figure 13, and will extend to the building walls as that is the point where the potential radiant heat impact of a bushfire does not

exceed 29 kW/m²; this point also demonstrates that bushfire risks on site can be managed. It is noted that the asset protection zone for the site includes areas that will be cleared or contain low-threat vegetation such as roads and landscaped areas in future that currently show as being within the BAL-FZ and/or BAL-29 zones.

2.4.4 Staging

Where possible to do so, a 100-m area will be cleared around components of the subdivision to maintain low-fuel conditions and reduce the bushfire risk, noting that no clearing will occur in areas where vegetation is to be retained within landscape protection areas. Where it is not possible to clear a 100-m area around each stage or Lots within a particular stage to provide the appropriate separation distance and BAL-rating, they will not be developed until an appropriate asset protection zone can be achieved. For the approved subdivision area, this will apply to Lots 1669 – 1675 with vegetation to the south to be cleared at a future stage, Lot 1676 with vegetation to the south and east to be cleared at some later time, and Lots 1697 and 1677 with vegetation to be cleared to the east. It will also apply to Lots 1620 and 1621 which are in proximity to vegetation in Lot 4205 Minderoo Crescent to the west of the site.