AMENDMENT NO. 1

TO THE

WISHART PLACE

AGREED STRUCTURE PLAN NO.1

This Amendment to the Agreed Structure Plan has been prepared under the provisions of the Shire of Denmark Town Planning Scheme No. 3

RECORD OF AMENDMENTS MADE TO THE WISHART PLACE

AGREED STRUCTURE PLAN NO.1

Amendment No.	Summary of the Amendment	Date approved by WAPC

AMENDMENT NO. 1 TO THE
WISHART PLACE AGREED STRUCTURE PLAN NO. 1

The Shire of Denmark, pursuant to its Town Planning Scheme No. 3, hereby recommends to the Western Australian Planning Commission to approve the abovementioned amendment by:

1. *Amending the Wishart Place Structure Plan Map to reflect a design change for Lot 371 Horsley Road, Denmark.*

1.0 STRUCTURE PLAN AREA

The Wishart Place Structure Plan area applies to Lots 369 and 370 Kearsley Road and Lot 371 Horsley Road, Denmark. This amendment relates to Lot 371 Horsley Road (the site) only (refer **Figure 1** reflecting design change and context).

A detailed plan illustrated the design change is shown in **Figure 2**.

2.0 STAGING

The site will be developed in two stages. Stage 1 will see the creation of two superlots, which comprise subdivision application WAPC reference number 157099 (refer **Appendix A**). The existing residences can be retained as part of the development of Stage 1.

Stage 2 will form the ultimate development of the site. Based on the superlot layout, Stage 2 can be developed in two distinct stages with each superlot being independent of the other. The timeframe for any development of Stage 2 is unknown.

3.0 SUBDIVISION AND DEVELOPMENT REQUIREMENTS

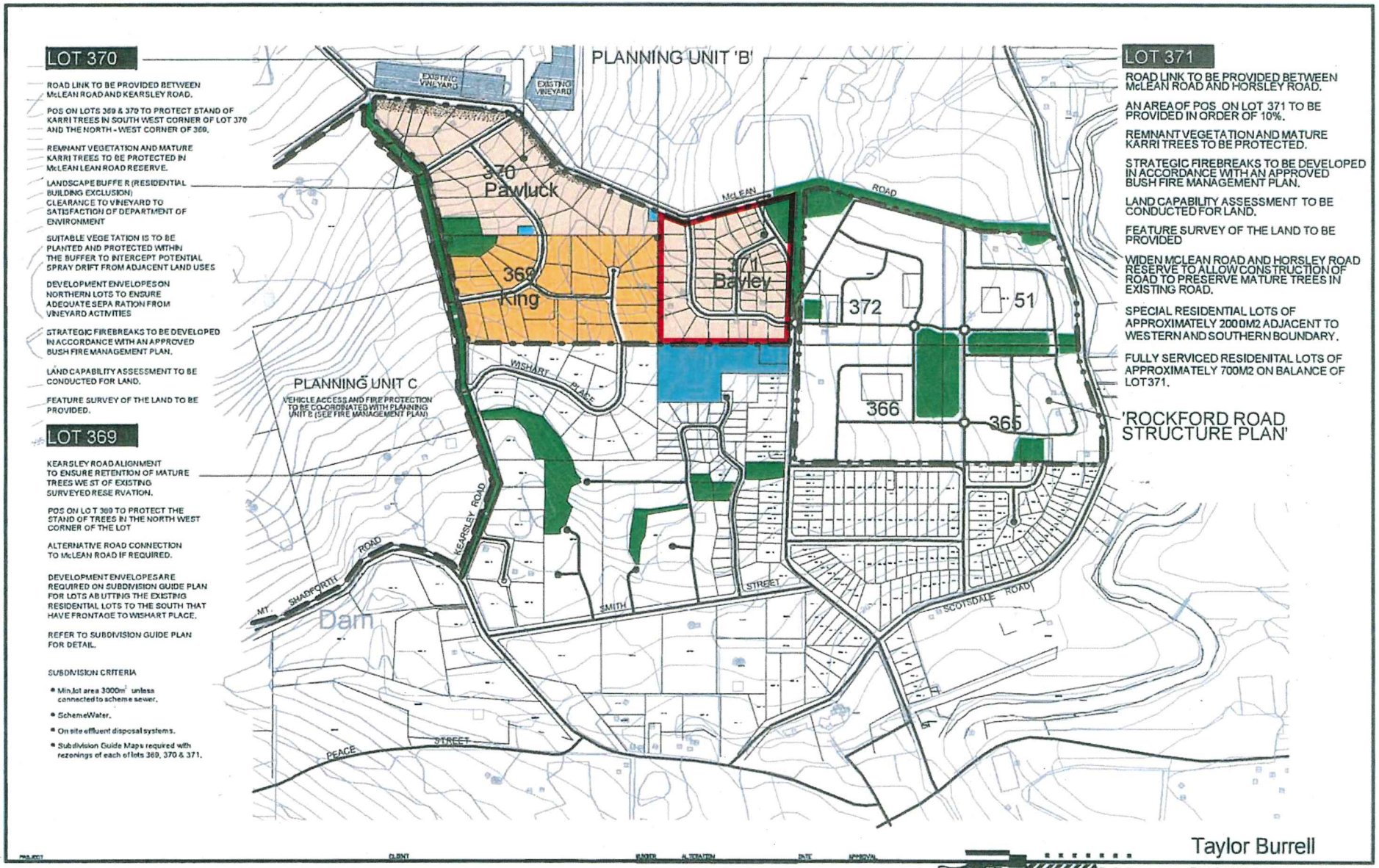
3.1 Hazards and Separation Areas

Any future dwelling(s)/structures located on lots identified within the Bushfire Prone Area of the Bushfire Management Plan (BMP- refer **Appendix B**) will require a Bushfire Attack Level assessment to be undertaken at the development application stage.

3.2 Environmental Features

A Tree Survey has been undertaken for the south eastern portion of the site (refer **Appendix C**). This has concluded that the current Structure Plan alignment will require the removal of significant Marri and Karri trees to facilitate development.

The design change reduces the impact the ultimate development will have on the identified significant trees.



SHIRE OF DENMARK - PLANNING UNIT 'B'
WISHART PLACE STRUCTURE PLAN

SUBJECT SITE

DATE	PLAN NUMBER	SCALE
Feb 2006	05-16-21.WR	1:7500

Taylor Burrell

Town planning and design

167 Roberts Road Subiaco
PO Box 503 Perth
Western Australia 6872
Telephone 08 9382 2911
Facsimile 08 9382 4566
Email planning@taylorburrell.com.au

FIGURE 1

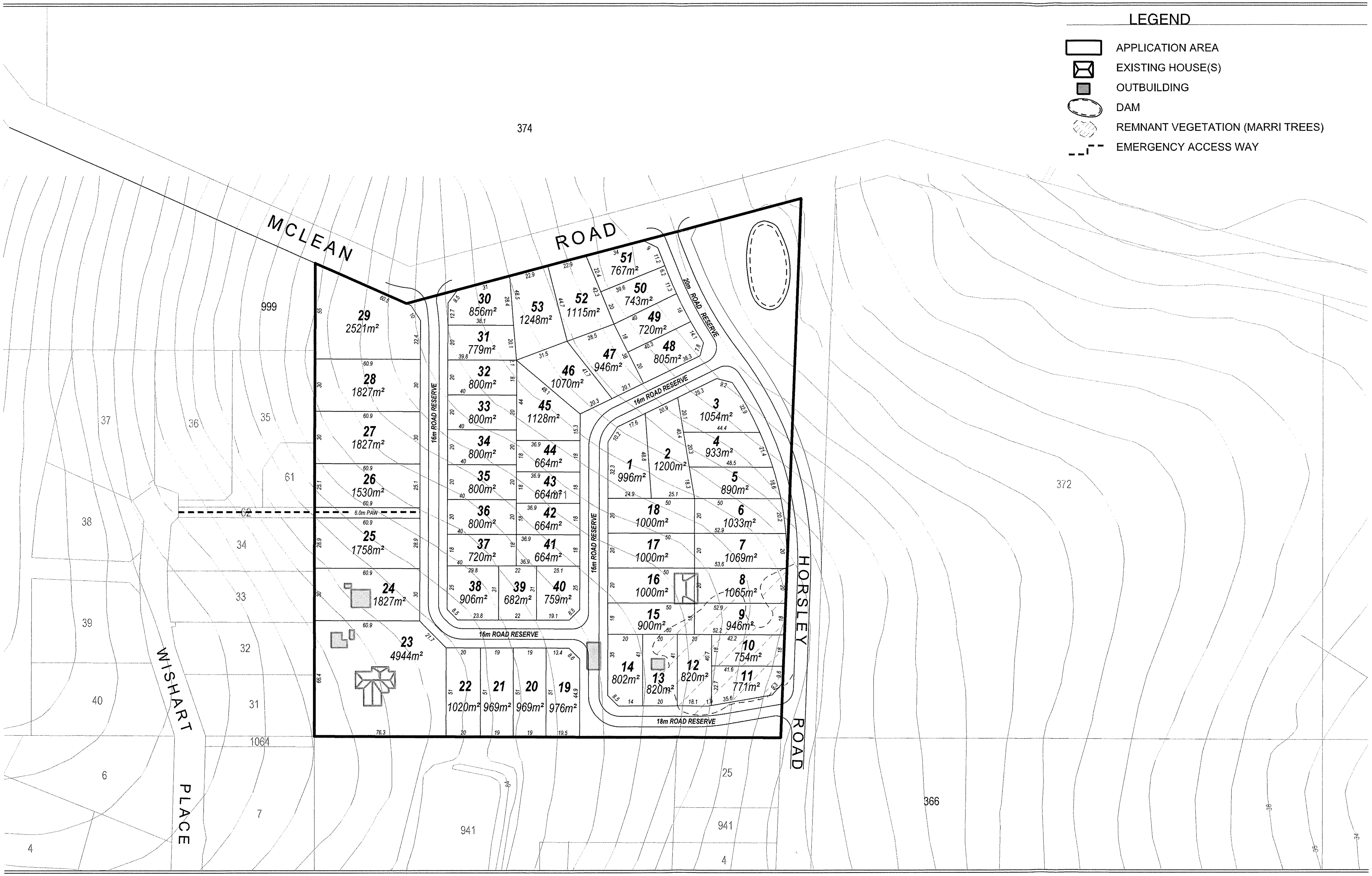


FIGURE 2 - DESIGN CHANGE

LOT 371 HORSLEY ROAD
DENMARK

WILLIAMS CONSULTING | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 21 Feb 2020 | ref - 18-005-003Bi
scale - 1:2000@ A3

This Structure Plan Amendment is prepared under the provisions of the Shire of Denmark Town Planning Scheme No.3.

IT IS CERTIFIED THAT THIS STRUCTURE PLAN AMENDMENT NO. 1 TO THE WISHART PLACE AGREED STRUCTURE PLAN NO. 1

WAS APPROVED BY

RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON

.....

Signed for and on behalf of the Western Australian Planning Commission

.....

an officer of the Commission duly authorised by the Commission pursuant to section 24 of the *Planning and Development Act 2005* for that purpose, in the presence of:

..... Witness

..... Date

..... Date of Expiry

PART 2 - EXPLANATORY REPORT

AMENDMENT NO.1 TO THE

WISHART PLACE AGREED STRUCTURE PLAN NO. 1

1.0 PLANNING BACKGROUND

1.1 Introduction and Purpose

This Structure Plan Amendment has been prepared in accordance with Schedule 2 Part 4 of the *Planning and Development (Local Planning Schemes) Regulations 2015*.

The purpose of the Structure Plan Amendment is to facilitate a design change over the site. In accordance with the current design (refer attached **Figure 3**), the southern east-west aligned access way connecting Horsley Road currently traverses a route comprising significant remnant vegetation, which at the time of road construction will require removal.

As identified in **Figure 2**, the design change relocates the southern, east- west aligned access way to the southern boundary of the site. The design change will impact the proposed lots in the south eastern corner of the site only (i.e. there will be no change to other lots in the Structure Plan).

The relocated southern access road traverses in a northerly direction at the boundary of proposed Lot 19 as referenced in **Figure 2**. Given the lot sizes, Lots 19-22 can be developed backing onto the Water Corporation's treatment infrastructure without buffer or BAL implications (refer BMP **Appendix B** confirming BAL contouring).

The design change requires less remnant vegetation to be removed in the future lots as opposed to the current design where the majority of vegetation is located in the road reserve and will require removal. In addition to this, relocating the subject east-west aligned access road enables a greater number of lots to be east west orientated as opposed to the current design, which has predominantly north south orientated lots in this location. This is of benefit as it enables the future lots to have a greater northern exposure and hence future dwellings can be designed for greater passive solar gain.

The intersection of the relocated access road from the site to Horsley Road makes allowance for safe vehicle access with a suitable truncation. The identified truncation area (refer the south eastern location in **Figure 2**) will be ceded to the Crown free of cost for the purpose of road reserve at the time of subdivision.

The Structure Plan design change for the site will facilitate the ultimate development of 7 Special Residential lots and 46 Residential (R12.5) lots. This will see a reduction of one lot from the current structure plan design.

1.2 Land Description

The area of the site comprises 7.5 hectares, with the individual lot legally described in **Table 1**.

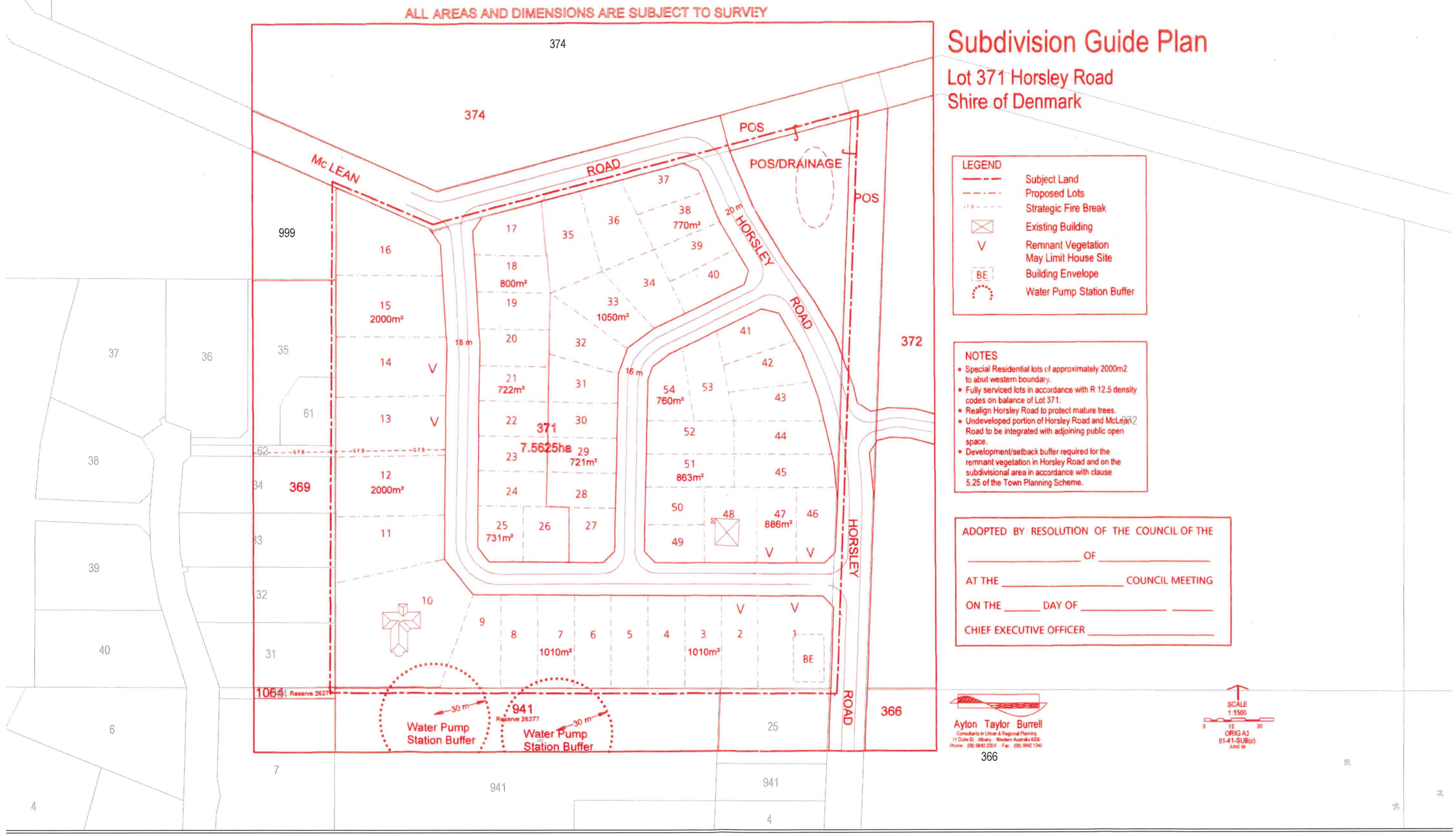
1.2.1 Location

The site is located within the Shire of Denmark local government area and obtains

ALL AREAS AND DIMENSIONS ARE SUBJECT TO SURVEY

Subdivision Guide Plan

Lot 371 Horsley Road
Shire of Denmark



LEGEND

- Subject Land
- Proposed Lots
- SFB Strategic Fire Break
- Existing Building
- V Remnant Vegetation May Limit House Site
- BE Building Envelope
- Water Pump Station Buffer

NOTES

- Special Residential lots of approximately 2000m2 to abut western boundary.
- Fully serviced lots in accordance with R 12.5 density codes on balance of Lot 371.
- Realign Horsley Road to protect mature trees.
- Undeveloped portion of Horsley Road and McLean Road to be integrated with adjoining public open space.
- Development/setback buffer required for the remnant vegetation in Horsley Road and on the subdivisional area in accordance with clause 5.25 of the Town Planning Scheme.

ADOPTED BY RESOLUTION OF THE COUNCIL OF THE

_____ OF _____

AT THE _____ COUNCIL MEETING

ON THE _____ DAY OF _____ _____

CHIEF EXECUTIVE OFFICER _____

Ayton Taylor Burrell
Consultants in Urban & Regional Planning
11 Duke St, Albany, Western Australia 6330
Phone: (08) 9842 2304 Fax: (08) 9842 1340

SCALE 1:1500
0 15 30
ORIG A3
01-41-SUB(c)
JUNE 08

FIGURE 3 - CURRENT SUBDIVISION GUIDE PLAN

LOT 371 HORSLEY ROAD
DENMARK

WILLIAMS CONSULTING | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 29 July 2019 | ref - 18-005-004
scale - 1:2000@ A3

N 0m 30m

legal road frontage from Horsley Road. The site is located approximately 1km north of the Denmark CBD.

The western boundary of the site comprises Lots 369 and 370 of the Wishart Place Structure Plan, Rural zoned land is located to the north, Lot 372 comprising the Horsley Road and Rockford Road Structure Plan is to the east and the Water Corporation's water reservoir and a freehold lot is to the south.

1.2.2 Area and Land Use

The majority of the site has historically been cleared for animal grazing with a portion of parkland cleared remnant vegetation in the south eastern corner.

There are two dwellings and associated outbuildings located in the south portion of the site.

1.2.3 Legal description and ownership

A copy of the Certificate of Title is included within **Appendix D.**

TABLE 1 - LEGAL SITE DESCRIPTION & CURRENT OWNERSHIP

Lot No.	Plan Number	Volume/Folio	Primary Interest Holder
371	230731	817/1	J. Bayley C. Lovell R. Bayley

2.0 PLANNING FRAMEWORK

2.1 Zoning and Reserves

2.1.1 Shire of Denmark Town Planning Scheme No.3.

The site has a split zoning of Residential (R12.5) and Special Residential under the Shire of Denmark's Town Planning Scheme No.3 (TPS3). This zoning was facilitated via Amendment No.78 to TPS 3.

As part of this amendment a development concept plan was prepared for the site, which is reflected in the Wishart Place Structure Plan.

2.2 Planning Strategies

2.2.1 Shire of Denmark Local Planning Strategy (2011)

The site is identified within the Shire of Denmark's 2011 Local Planning Strategy (LPS) as being within Planning Unit B- Wishart Place Structure Plan. This makes allowance for the provision of 54 Urban Residential Lots and 52 Special Residential lots. Of these, 9% had been developed at the time of preparation of the LPS.

Within the LPS there are 1,306 Urban Residential lots identified within the Urban

Residential Expansion Area, which include the 54 Urban Residential Lots in Planning Unit B.

The design change and resultant drop of one urban residential lot over the site represents a 1.8% loss of yield for Planning Unit B and a 0.7% loss for the identified Urban Residential Lots. Given this, the reduced yield will not have a significant impact on the lot yield projections for the LPS.

3.0 SITE CONDITIONS AND CONSTRAINTS

3.1 Biodiversity and Natural Area Assets

The majority of the site has been cleared and is used for animal grazing. The south eastern corner however consists of mature Marri and Karri trees as identified in the tree survey (refer **Appendix C**). As addressed in the tree survey, the design change will provide for the retention of the majority of these trees.

3.2 Bushfire Hazard

As mentioned in Part 1, a BMP has been prepared for the site- refer **Appendix B**.

The BMP confirms the Structure Plan design achieves the Acceptable Solutions and Performance Principles of SPP 3.7, namely as follows:

Element 1- Location

Given the majority of the site and the area surrounding comprises cleared pasture or existing residences, the site can ultimately be developed in accordance with a suitable Bushfire Attack Level (BAL) rating.

Element 2- Siting and Design

At the time of dwelling construction for the future lots on site, based on the location of the development a suitable Asset Protection Zone and BAL rating can be achieved.

Element 3- Vehicular Access

With the ultimate development of the site and surrounding road reserves (i.e. McLean Road to the north and Horsley Road to the east) there are two access routes available for egress from the site. Furthermore, the design change also provides for an emergency access way linking Wishart Place to the subdivision. This provides greater egress for the development and the existing residents of Wishart Place.

All public roads will be constructed to Shire of Denmark standards. There will be no cul-de-sacs, battle axe legs and fire access ways.

All future fire mitigation works on the developed lots can be undertaken in accordance with the Shire of Denmark Annual Fire Notice.

Element 4- Water

A suitable fire fighting water supply will be provided at the time of subdivision via

the provision of the Water Corporation's potable water supply.

5.0 CONTEXT AND OTHER LAND USE CONSTRAINTS AND OPPORTUNITIES

The most significant land use constraint impacting the site is the remnant vegetation in the south eastern corner, which this design change accommodates. There are however two external constraints to be considered, which are as follows:

Water Corporation Buffer

As noted above a portion of the southern boundary of the site abuts the Water Corporation's potable water supply infrastructure. In meeting the suitable buffer requirements from the infrastructure, the current Structure Plan design provides for suitable sized Special Residential lots so future dwellings will not be impacted by the buffer (i.e. Lots 19-23. The subject design change sees no change to these lots and as such there will be no impacts on development from the Water Corporation buffer.

Southern Lot

There is a single residential lot located on the south eastern boundary of the site (i.e. Lot 25 Horsley Road). The current Structure Plan identifies future lots directly abutting this lot. In undertaking the design change, the southern east-west access road will abut this lot. As the relocated east west road will be an access street within the development, it is not forecast to carry large volumes of traffic and it is not considered there will be impact on the amenity of this property. To ensure privacy and provide a visual screening, at the time of development, a suitable condition can be placed on subdivision requiring the planting of vegetation on the southern boundary of the road reserve.

During the advertising of the Structure Plan, the owner of Lot 25 Horsley Road will be consulted.

6.0 CONCLUSION

This Structure Plan Amendment has been prepared to facilitate a design change over Lot 371 Horsley Road, within the Wishart Place Structure Plan. The design change results in a subdivision layout, which provide for a better environmental outcome without creating adverse effects on the receiving amenity of the locality.

The Structure Plan Amendment has been prepared within the context of the various WAPC and Shire of Denmark guiding planning documents.

Overall, noting the existing approved Structure Plan, the site's context and location, and the conclusions of the supporting technical document, the suitability of the design change is accepted.

Appendix A- Superlot Subdivision Application

LEGEND

- APPLICATION AREA
- EXISTING HOUSE
- OUTBUILDING
- DAM
- REMNANT VEGETATION (MARRI TREES)

MCLEAN ROAD

HORSLEY ROAD

WISHART PLACE

371
(7.5618ha)

1
3.2897ha

2
4.2719ha

374 999 37 36 35 61 62 38 34 33 39 32 40 31 6 7 4 941 25 941 4 372 366

57.6 62 174.3 50.5 271.3 116 300.5 10.2 39 47.1 50 116.4 269.9 9 1064

PLAN OF SUBDIVISION

LOT 371 HORSLEY ROAD DENMARK

SAM WILLIAMS | TOWN PLANNING & PROJECT MANAGEMENT
ph: 0418 116216 | email: samwilliams@westnet.com.au

date - 28 June 2018 | ref - 18-005-001B
scale - 1:2000@ A3

N 0m 30m

Appendix B- Bushfire Management Plan

Bushfire Management Plan

(BMP)

Site Details			
Address:	Lot 371 Horsley Road		
Suburb:	Denmark	**State:**	W.A.
Local Government Area:	Shire of Denmark		
Description of Building Works:	N/A		
Stage of WAPC Planning	Structure Plan and WAPC subdivision application		

BMP Report Details			
Report / Job Number:	SWP008-002	**Report Version:**	FINAL Vers 2
Assessment Date:	24/07/2018 & 7/01/2020	**Report Date:**	24/02/2020
BPAD Practitioner	Kathryn Kinnear	**Accreditation No.**	BPAD 30794

BIO DIVERSE SOLUTIONS

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

BIO DIVERSE

SECTION 1: Proposal details

This Bushfire Management Plan has been prepared to support a proposed Local Structure plan, which will facilitate the creation of two super lots over Lot 371 Horsley Road Denmark (the site). The site is located within the locality of the Shire of Denmark (SoD). The site comprises an area of 7.562ha and is located 1.2km north of the Denmark town centre.

A subdivision application has been lodged over the site for the creation of two super lots- WAPC reference number 157099. At the request of WAPC, to support the subdivision application, an indicative Structure Plan (SP) has been prepared over the site and assessed to the Guidelines for Planning in Bushfire Prone Areas. The SP is shown in Figure 1.

There are two existing dwellings on the site, one located in the east and one located in the west of the property. Refer to Figure 2 and Location Map Figure 3. This document has been prepared to assess the site as it is located in a designated WA Bushfire Prone Area (Figure 4).

The site is currently zoned "Special Residential" and "Residential R12.5" under the Shire of Denmark's Town Planning Scheme No.3 (TPS3). The site currently comprises two residential dwellings and associated outbuildings.

Super lots 1 and 2 will be 3.2ha and 4.2ha respectively and obtain legal road frontage to the constructed portion of Horsley Road. The lodgement of the super lot application for two lots has been necessitated to enable the two residential dwellings to be placed on separate titles.

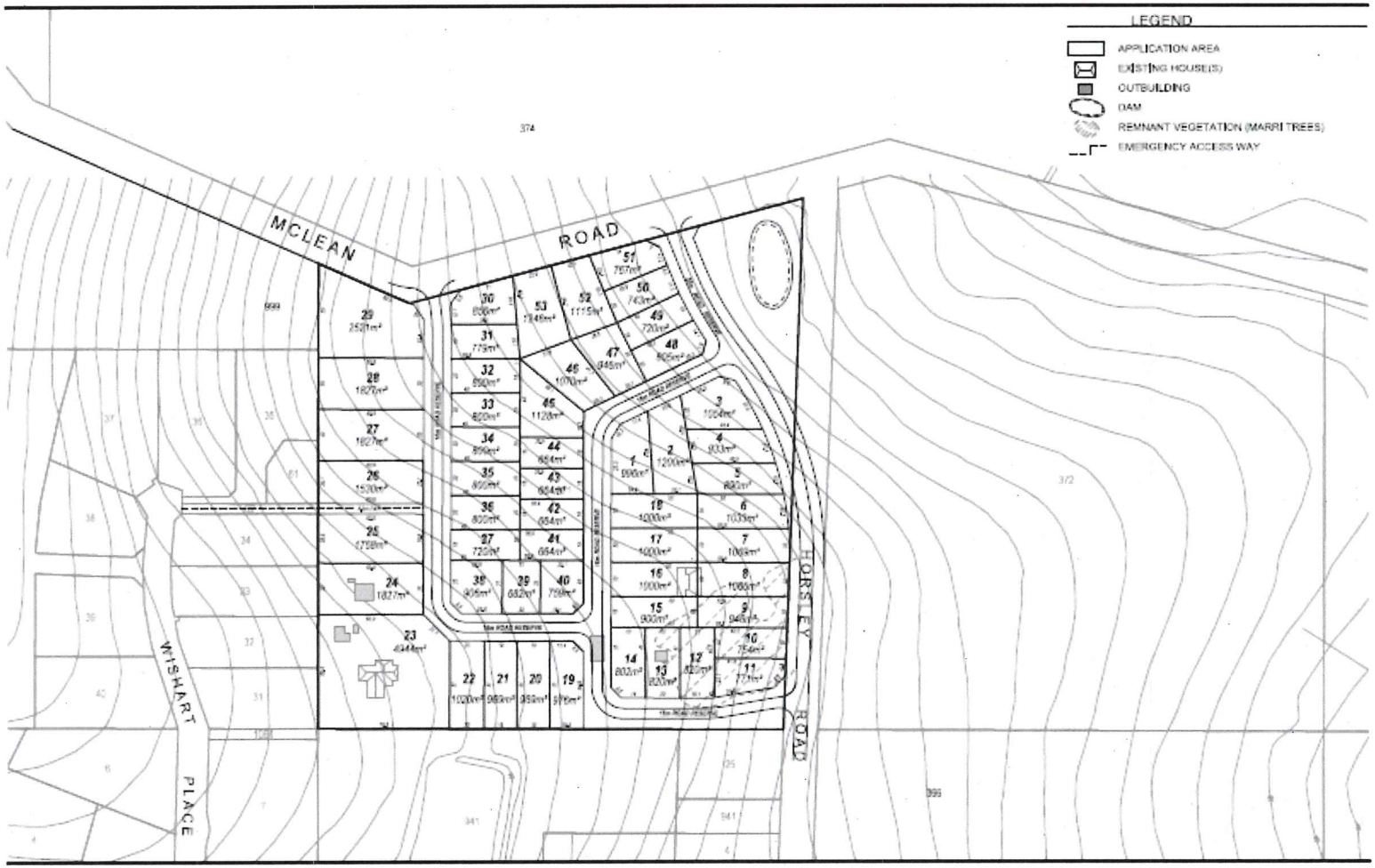


Figure 1: Structure Plan

BIO DIVERSE SOLUTIONS

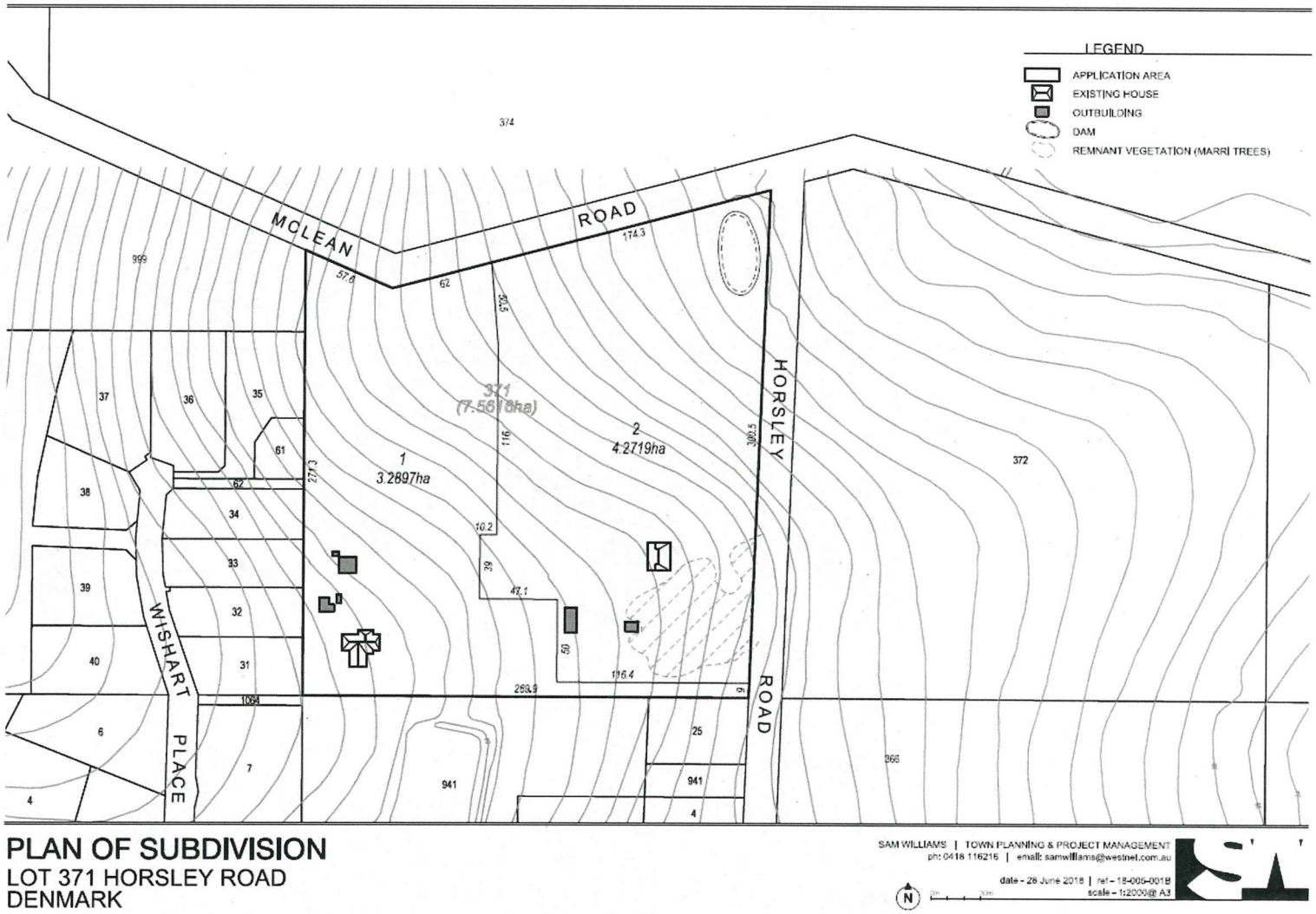


Figure 2: Plan of subdivision 2 lots

BIO DIVERSE SOLUTIONS

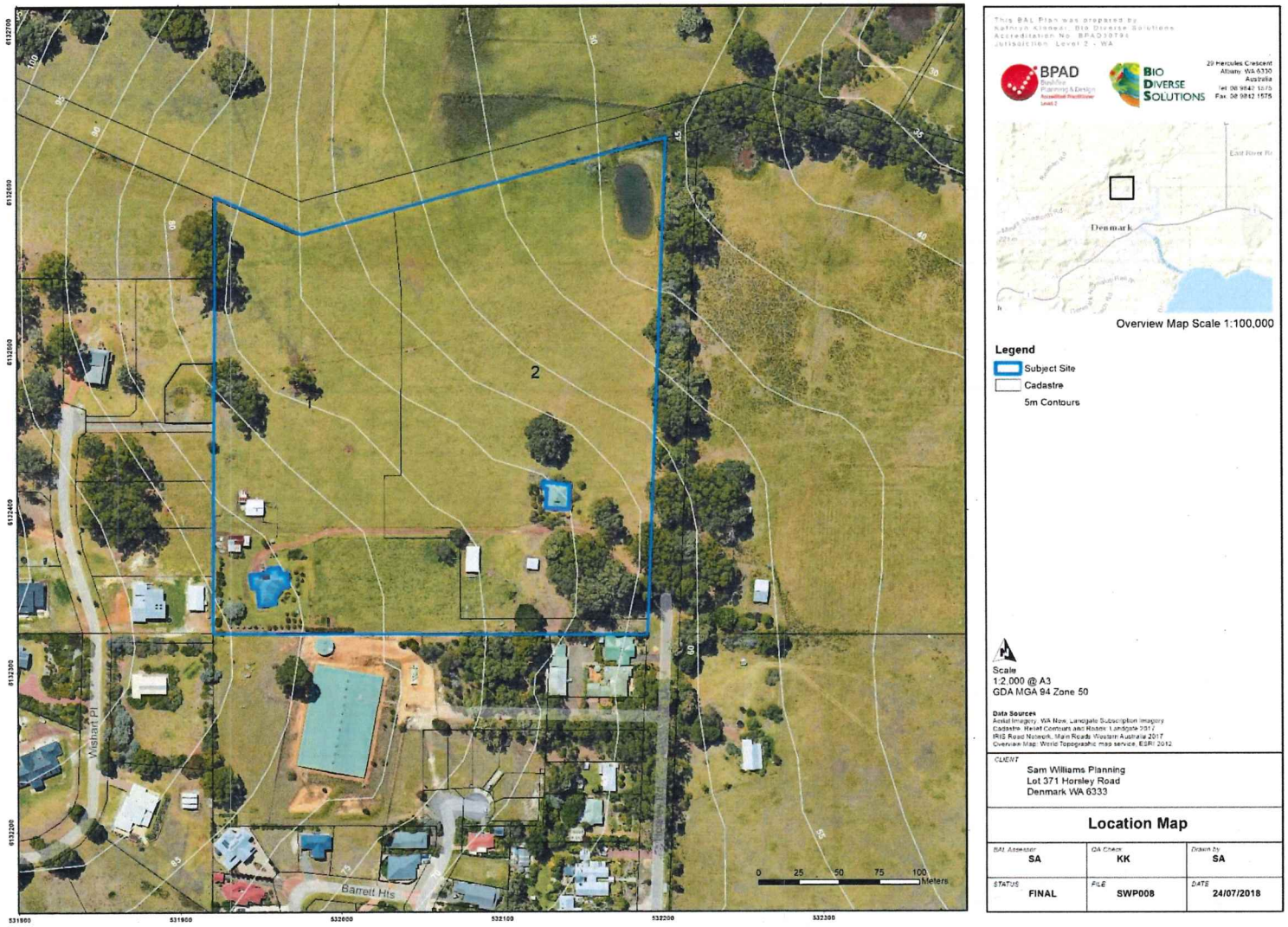


Figure 3: Location Map

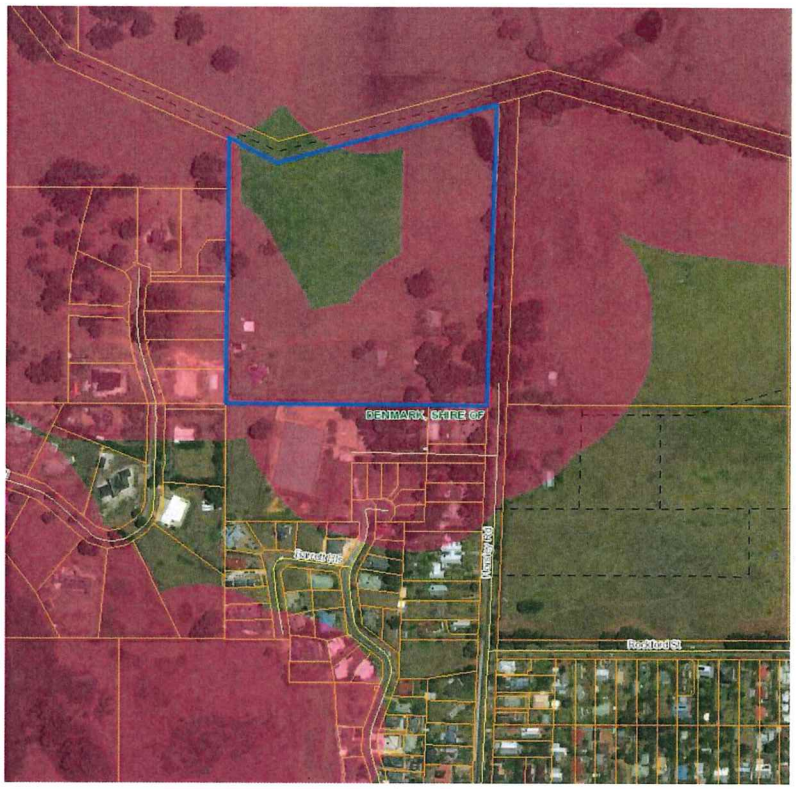


Figure 4: State Bushfire Prone Area Mapping

SECTION 2 – Environmental Considerations

Vegetation modification proposed: There is no modification of vegetation proposed for the super lot (2-lot) development. External to the Structure Plan will require a small amount of vegetation clearing to extend Horsley Road into the subject lot. Environmental Assessment has not been undertaken of this area to date and may be required prior to clearing operations. Noting that the southern end of McLean Road is uncleared road reserve, is relatively disturbed from access into the road reserve and constructed drains present. It is not considered that it would trigger any referrals from environmental agencies.

Internal to the Structure Plan proposal, the BAL contour plan assumes classified vegetation onsite (Refer to Section 3.2 of this report) can either be removed or modified from around the affected lots to the extent required so that the proposed lots will have sufficient developable area in the SP development. Any proposed vegetation removal may be subject to DWER and/or local government approval and environmental assessment may be required.

Re-vegetation/landscape plans: No landscaping or revegetation is proposed at this stage for this SP or subsequent subdivision. Landscaping at the entry points of the SP may occur in the future and will be subject to LGA approval.

SECTION 3: Bushfire Assessment Results

SECTION 3.1. Bushfire Assessment Inputs

The bushfire assessment for this site follows the method 1 BAL assessment process and includes:

- WA adopted Fire Danger Index (FDI), being FDI 80;
- Vegetation Classes;
- Slope under classified vegetation;
- Distance between proposed development site and classified vegetation.

A site inspection was conducted on the 7th January 2020 by Kathryn Kinnear (Level 2 BPAD 30794) to assess the current land use, topography/slope, vegetation and conditions of the site and its surroundings. Photographs of the subject site and surrounding areas were taken and have been presented in the plot data of this report.

All vegetation within 150m of the Subject Site was classified in accordance with Clause 2.3 and Exclusions as per Clause 2.2.3.2 of AS 3959-2018. Each plot is representative of the Vegetation Classification to AS3959 Table 2.3 and shown on the Vegetation Classification Mapping (Figure 5) with full plot data presented in the following pages.

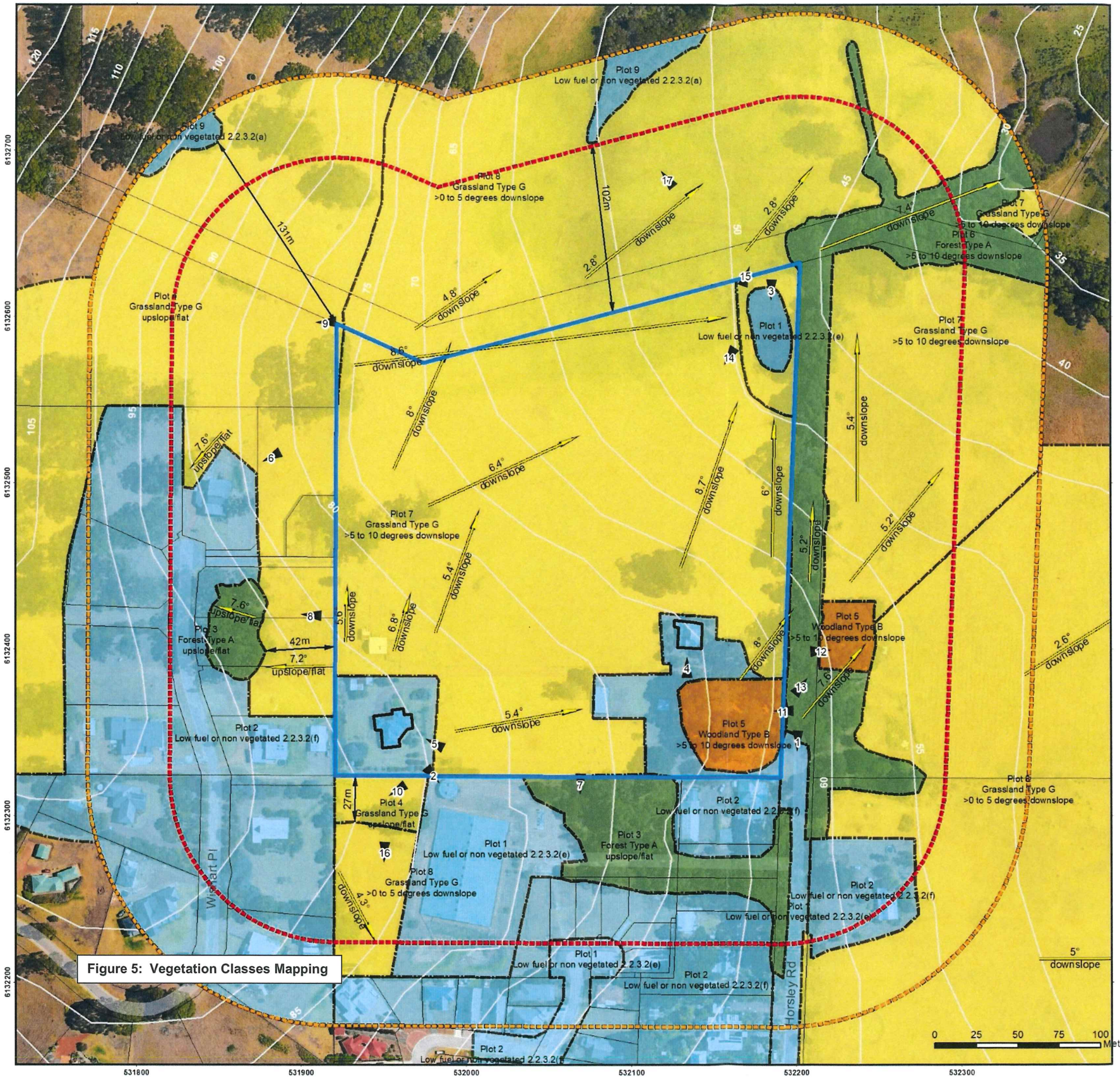
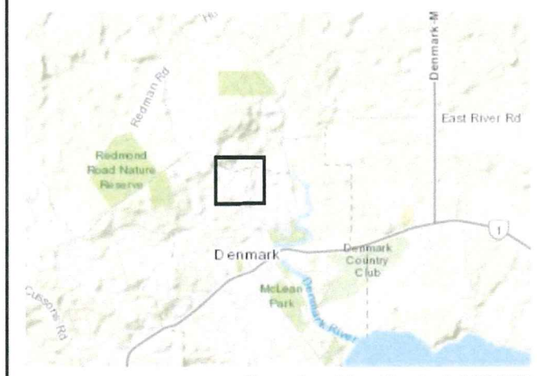


Figure 5: Vegetation Classes Mapping

This BAL Plan was prepared by
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No. BPAD30794
Jurisdiction: Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

BIO DIVERSE SOLUTIONS
29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575



Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- 5m Contours
- Photo Point
- Slopes Degrees
- Separation Distance
- Existing Dwelling
- Vegetation/Plot Boundary

Vegetation

- Forest Type A
- Woodland Type B
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2

Scale
1:2,250 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Williams Consulting Town Planning & Project Management
Lot 371 Horsley Road
Denmark, WA 6333

Vegetation Classes

BAL Assessor	*QA Check*	*Drawn by*
KK	**JB**	**BT**
STATUS	*FILE*	*DATE*
FINAL	**SWP008-002**	**03/02/2020**

Plot	1	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (e)

Location: Internal to the site and external in adjacent existing urban areas.

Description: Hardstand areas, roads, driveways parking areas and buildings. Excluded as per AS3959 exclusion clause 2.2.3.2 (e).

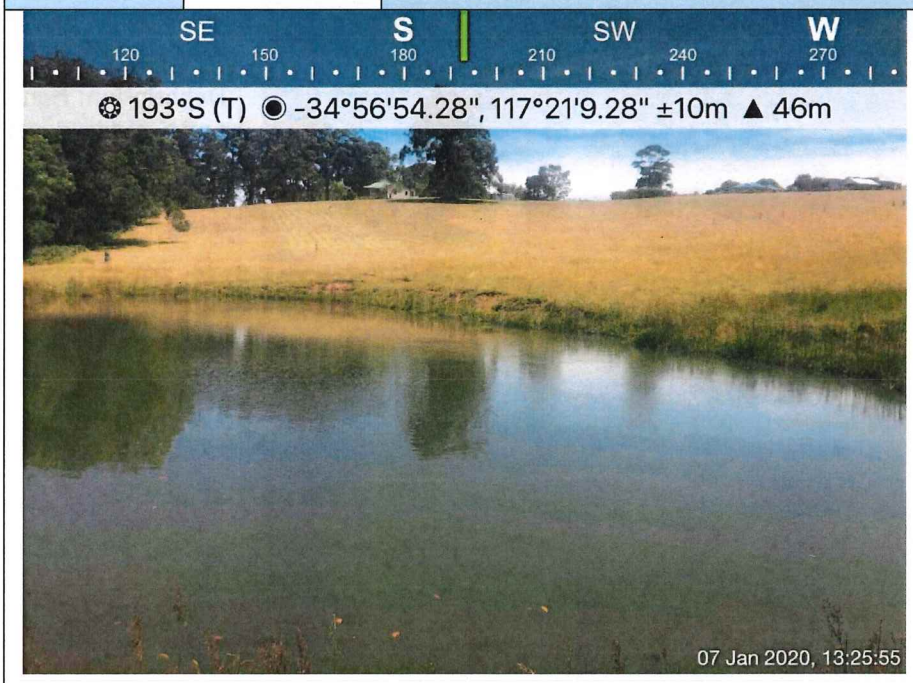
Photo Id 1: View to the south of Horsley Road, Plot 1.

Plot	1 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (e)

Additional Photo of Plot 1.

Photo Id 2: View to the south east of the Water Corporation treatment plan located south of the subject site.

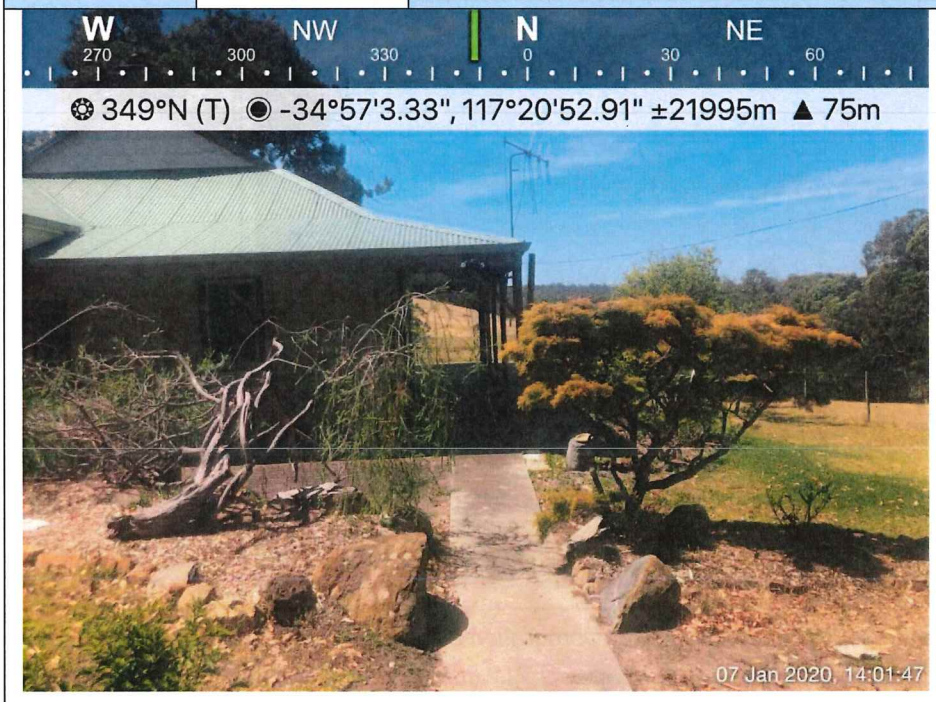
Plot	1 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (e)



Additional Photo of Plot 1.

Photo Id 3: View to the south of large dam in north east of subject site.

Plot	2	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)



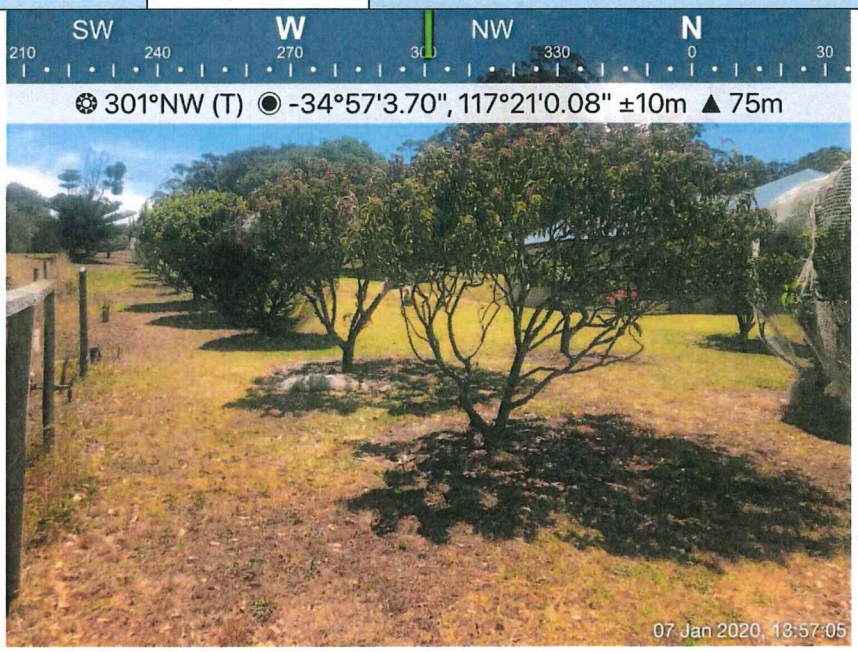
Location: Internal to the site around existing houses and external in existing residential area.

Description: Maintained gardens and lawns around the existing buildings, street verges and lawns in existing residential area. Excluded as per AS3959 exclusion clause 2.2.3.2 (f).

Available fuel loading: <2 t/ha.

Photo Id 4: View to the north of existing dwelling in the south east of the subject site.

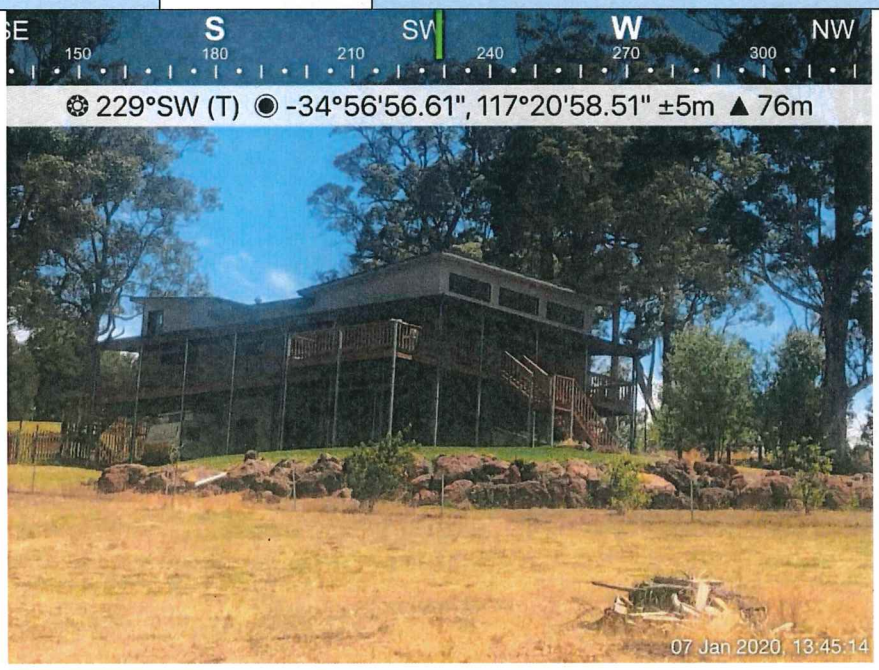
Plot	2 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)



Additional Photo of Plot 2

Photo Id 5: View to the west/north west of APZ area on south west dwelling in subject site.

Plot	2 cont.	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (f)



Additional Photo of Plot 2

Photo Id 6: View to the south west of existing residential areas to the west of the subject site in low fuel condition.

Plot	3	Classification or Exclusion Clause	Forest Type A

Location: Located to the south of the subject site in adjacent private property. West on adjacent lot

Separation distance: 0m to lot boundary to the south of the subject site and 42m to the east of the subject site.

Dominant species & description: Karri forest consisting of Karri, Sheoak, Acacia, Karri Hazel, bracken, and Leucopogon. Multilayered.

Average vegetation height: 10–15m.

Vegetation Coverage: <30-70 % foliage cover.

Available fuel loading: 25-35 t/ha.

Effective slope: Upslope.

Photo Id 7: View to the south of Forest Type A located to the south of the subject site.

Plot	3 cont.	Classification or Exclusion Clause	Forest Type A

Additional photo of Plot 3.

Photo Id 8: View to the west of Forest Type A located to the west of the subject site.

Plot	4	Classification or Exclusion Clause	Grassland Type G

Location: Located to the south and west of the subject site in grazed paddock areas.

Separation distance: 0m (internal).

Dominant species & description: Grazed paddocks consisting of Kikuyu.

Average vegetation height: 50mm.

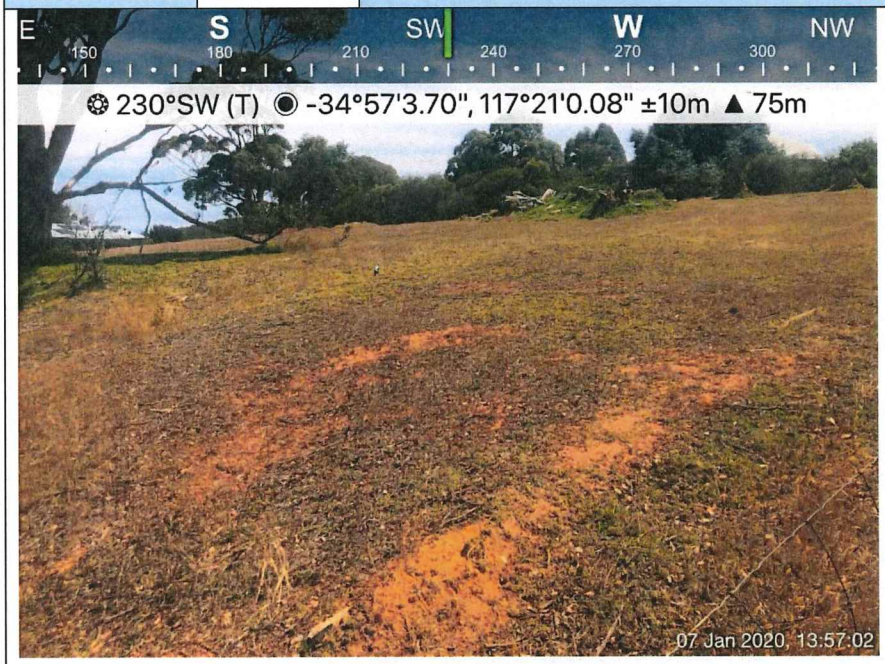
Vegetation Coverage: <10% trees.

Available fuel loading: 4.5 t/ha.

Effective slope: Upslope.

Photo Id 9: View to the west of Grassland Type G.

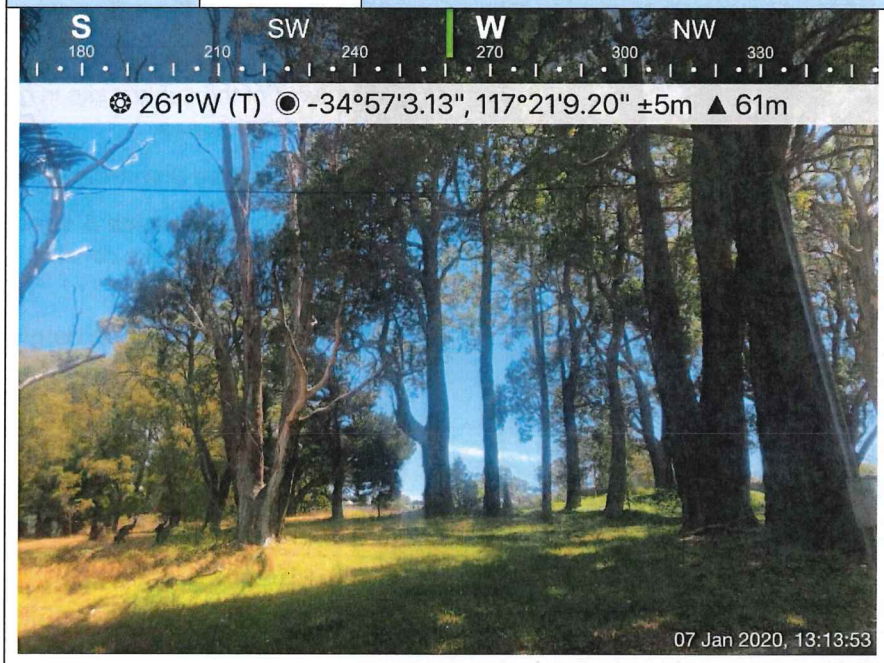
Plot	4 cont.	Classification or Exclusion Clause	Grassland Type G



Additional Photo of Grassland Type G located to the south of the subject site.

Photo Id 10: View to the south west of Plot 4 located to the south of the western house.

Plot	5	Classification or Exclusion Clause	Woodland Type B



Location: Located to the south and south east of the subject site.

Separation distance: 25m.

Dominant species & description: Jarrah, Karri, Marri, grassy understory not multilayered.

Average vegetation height: 12–20m.

Vegetation Coverage: 10–30% foliage cover.

Available fuel loading: 15–25 t/ha.

Effective slope: Downslope >5-10 degrees.

Photo Id 11. View to the south west through Woodland Type B, note 2m height staff in foreground.

Plot	5 cont.	Classification or Exclusion Clause	Woodland Type B

Additional photo Plot 5.

Photo Id 12. View to the east through Woodland Type B, background of photo in paddock.

Plot	6	Classification or Exclusion Clause	Forest Type A

Location: Located to the east of the subject site in Shire road reserve (unconstructed).

Separation distance: 53m.

Dominant species & description: Karri Forest consisting of Karri, Marri, Watsonia, Bracken, Acacia, Melaleuca. Multilayered.

Average vegetation height: 12–20m.

Vegetation Coverage: >30-70% foliage cover.

Available fuel loading: 25-35 t/ha.

Effective slope: Downslope >5-10 degrees.

Photo Id 13: View to the north east in Plot 6 in unformed road reserve north of Horsley Road.

Plot	7	Classification or Exclusion Clause	Grassland Type G

Location: Internal to site and east of subject site

Separation distance: 5m.

Dominant species & description: Grazed paddocks consisting of Kikuyu.

Average vegetation height: 50mm.

Vegetation Coverage: <10% trees.

Available fuel loading: 4.5 t/ha.

Effective slope: Downslope >5 -10 degrees.

Photo Id 14: View to the south west through Plot 7.

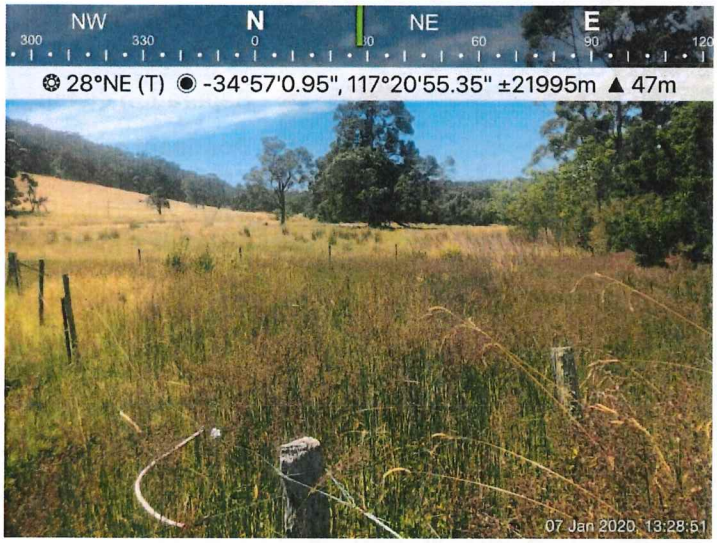
Plot	8	Classification or Exclusion Clause	Grassland Type G
			**Location:** Located to the north of the subject site in grazed paddock areas. **Separation distance:** 0m (internal). **Dominant species & description:** Grazed paddocks consisting of Kikuyu. **Average vegetation height:** 50mm. **Vegetation Coverage:** <10% trees. **Available fuel loading:** 4.5 t/ha. **Effective slope:** Downslope >0 -5 degrees.

Photo Id 15: View to the north east through adjacent paddocks to the north east.

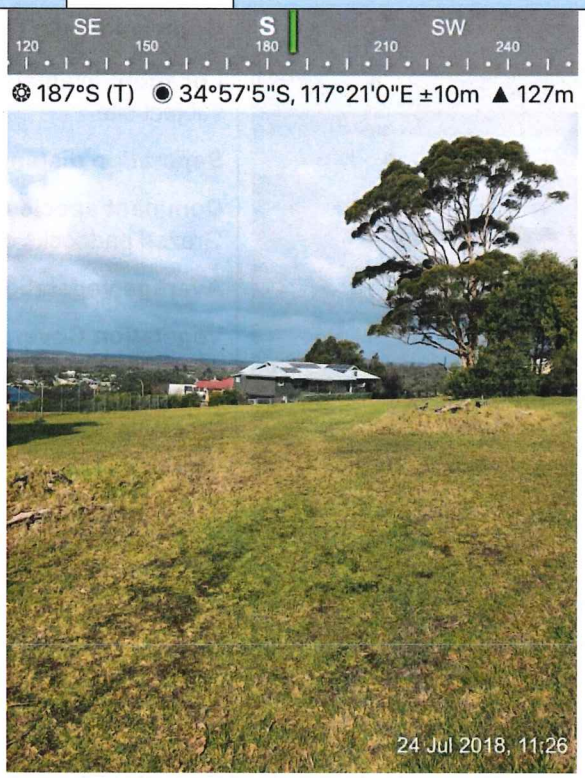
Plot	8	Classification or Exclusion Clause	Grassland Type G
			**Additional photo Plot 8.**

Photo Id 16: View to the south through adjacent paddocks to the south of the subject site.

Plot	9	Classification or Exclusion Clause	Low fuel or non-vegetated areas exclusion 2.2.3.2 (a)
			**Location:** Located to the north west and north in adjacent paddocks. **Separation distance:** 102m. **Description:** Areas of vegetation located >100m from the subject site.
Photo Id 17: View to the north of Plot 9 in adjacent paddocks. Note taken from a distance due to limited access to paddocks.			

Comments on Vegetation Classifications

- Distances from vegetation were made based on surface fuels to edge of lot (subject site) boundary;
- Effective slopes were measured in the field using a Nikon Forestry Pro and represented on the respective plots;
- Method 1 (AS3959-2009) Simplified procedure was used for vegetation classification process;
- All vegetation was classified within the subject site and within 150m of the lot boundary to Table 2.3 and Exclusions 2.2.3.2 (a-f) of AS3959; and
- The perimeter of the vegetation was measured using field GPS and notations on field GIS maps.

SECTION 3.2. Bushfire Assessment Outputs

Bushfire Hazard Level (BHL)

The BHL process provides an indication of the likely impact of a bushfire event as it interacts with the bushfire hazards within and adjacent to the site. The BHL is a measure of the likely intensity of a bushfire and the likely level of bushfire attack on a site by categorizing the hazard (WAPC, 2017). The allocation of category of the bushfire hazard is determined as per Table 3 of the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017) as shown on Figure 6.

Table 3: BHL and classified vegetation (as per AS-3959)

HAZARD LEVEL	CHARACTERISTICS
Extreme	• Class A: Forest • Class B: Woodland (05) • Class D: Scrub • Any classified vegetation with a greater than 10 degree slope
Moderate	• Class B: Open woodland (06), Low woodland (07), Low open woodland (08), Open shrubland (09)* • Class C: Shrubland • Class E: Mallee/Mulga • Class G: Grassland, including sown pasture and crops • Vegetation that has a low hazard level but is within 100 metres of vegetation classified as a moderate or extreme hazard, is to adopt a moderate hazard level.
Low	• Low threat vegetation may include areas of maintained lawns, golf courses, public recreation reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks. • Managed grassland in a minimal fuel condition (insufficient fuel is available to significantly increase the severity of the bushfire attack). For example, short-cropped grass to a nominal height of 100 millimetres. • Non-vegetated areas including waterways, roads, footpaths, buildings and rock outcrops.

Figure 6: BHL Assessment allocation of category (WAPC, 2017)

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are presented in Table 1 and shown on the Pre-development BHL mapping (Figure 7) and Post Development BHL Mapping (Figure 8).

Table 1 - Potential Bushfire impacts to the Structure Plan (BHL)

Plot number	Vegetation Type (Table 2.3)	Effective Slope (Table 2.4.3)	BHL Pre Construction	BHL post Construction
1	Low fuel or non-vegetated areas Exclusion 2.2.3.2 (e).	N/A	Low	Low
2	Low fuel or non-vegetated areas Exclusion 2.2.3.2 (f).	N/A	Low	Low
3	Forest Type A	Flat/Upslope	Extreme	Extreme
4	Grassland Type G	Flat/Upslope	Moderate	Moderate
5	Woodland Type B	Downslope >5-10 degrees	Extreme	Extreme
6	Forest Type A	Downslope >5-10 degrees	Extreme	Extreme
7	Grassland Type G	Downslope >5-10 degrees.	Moderate	Moderate
8	Grassland Type G	Downslope >0-5 degrees.	Moderate	Moderate
9	Low fuel or non-vegetated areas Exclusion 2.2.3.2 (a).	N/A	Low	Low

NOTES ON BHL ASSESSMENT

- The BHL assessment was prepared by an Accredited Level 2 Bushfire Planning Practitioner (BPAD30794);
- The BHL Assessment and Map has been prepared in accordance with Department of Planning (WAPC) Guidelines for Planning in Bushfire Prone Areas Version 1.3 (WAPC, 2017);
- Post development BHL mapping assumes/for the SP that onsite vegetation (Plot 7 Grassland and Plot 5 Woodland) modification can occur, refer to Vegetation Classes Mapping (Figure 5); and
- Subject site is partially located in a Bushfire Prone Area; see Figure 4 (OBRM, 2019).

BAL Assessment individual existing dwellings

Detailed method 1 BAL Assessments were undertaken in 2018 on the two existing dwellings, refer to Appendix A and B. The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below in Table 2 and detailed/shown on the BAL Assessments Appendix A and B.

Table 2 - Potential Bushfire impacts to AS3959 2- lot subdivision

Lot number	Vegetation Type (Table 2.3)	Slope (Table 2.4.3)	Separation distance to vegetation (m)	Highest BAL Contour	Modified BAL Contour
1 (Western house)	Grassland Type G (Plot4)	Upslope/flat	17m	BAL 19	BAL 19
2 (Eastern House)	Grassland Type G (Plot 7)	Downslope >5–10 degrees	5m	BAL FZ	BAL 29 can apply with a 10m APZ applied

A BAL contour Plan was prepared on the proposed SP and shown in Figure 9, the potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified in Table 3.

For the SP proposal, the BAL contour plan assumes classified vegetation onsite (Plot 7 Grassland and Plot 5 Woodland) the can either be removed or modified from around the affected lots to the extent required so that the proposed lots will have sufficient developable space to achieve a BAL rating of BAL-29 or lower for future development.

Onsite vegetation is under the control of the landowner can potentially be removed or modified to a low threat state, onsite vegetation (Plot 7 Grassland and Plot 5 Woodland) has been excluded from the BAL Contour mapping over the Lot.

Note: Any proposed vegetation removal may be subject to DWER and/or local government approval and environmental assessment may be required.

Table 3 - Potential Bushfire impacts to AS3959 2- Structure Plan (BAL Contour Plan)

Lot number	Vegetation Type (Table 2.3)	Slope (Table 2.4.3)	Highest BAL Contour Impacting the Lot	Potential Developable Space BAL Rating
1-2	Forest Type A (Plot 6)	D/S >5-10 Degrees	BAL-12.5	BAL-12.5
3-11	Forest Type A (Plot 6)	D/S >5-10 Degrees	BAL-FZ	BAL-29
12-14	Forest Type A (Plot 3)	Upslope/Flat	BAL-40	BAL-29
15-18	Forest Type A (Plot 6)	D/S >5-10 Degrees	BAL-12.5	BAL-12.5
19-21	Forest Type A (Plot 3)	Upslope/Flat	BAL-FZ	BAL-29
22	Forest Type A (Plot 3)	Upslope/Flat	BAL-40	BAL-29
23-29	Grassland Type G (Plot 4)	Upslope/Flat	BAL-FZ	BAL-12.5
30-31	Grassland Type G (Plot 8)	D/S >0-5 Degrees	BAL-12.5	BAL-12.5
32-36	N/A	N/A	BAL-LOW	BAL-LOW
37-41	Forest Type A (Plot 3)	Upslope/Flat	BAL-12.5	BAL-12.5
42-46	N/A	N/A	BAL-LOW	BAL-LOW
47	Forest Type A (Plot 6)	D/S >5-10 Degrees	BAL-12.5	BAL-12.5
48	Forest Type A (Plot 6)	D/S >5-10 Degrees	BAL-19	BAL-12.5
49-50	Forest Type A (Plot 6)	D/S >5-10 Degrees	BAL-12.5	BAL-12.5
51-53	Grassland Type G (Plot 8)	D/S >0-5 Degrees	BAL-12.5	BAL-12.5

NOTES ON BAL CONTOUR ASSESSMENT

- The BAL Contour Plan was prepared by an Accredited Level 2 Bushfire Planning Practitioner (BPAD30794);
- The BAL Contour Plan has been prepared in accordance with Department of Planning (WAPC) Guidelines for Planning in Bushfire Prone Areas Version 1.3 (WAPC, 2017);
- The BAL Contour Plan assumes/for the SP that onsite vegetation (Plot 7 Grassland and Plot 5 Woodland) modification can occur, refer to Vegetation Classes Mapping (Figure 5); and
- Subject site is partially located in a Bushfire Prone Area; see Figure 4 (OBRM, 2019), referring to the matter that only lots/proposed buildings located in the Bushfire Prone Area mapping are legally required to build to AS3959.

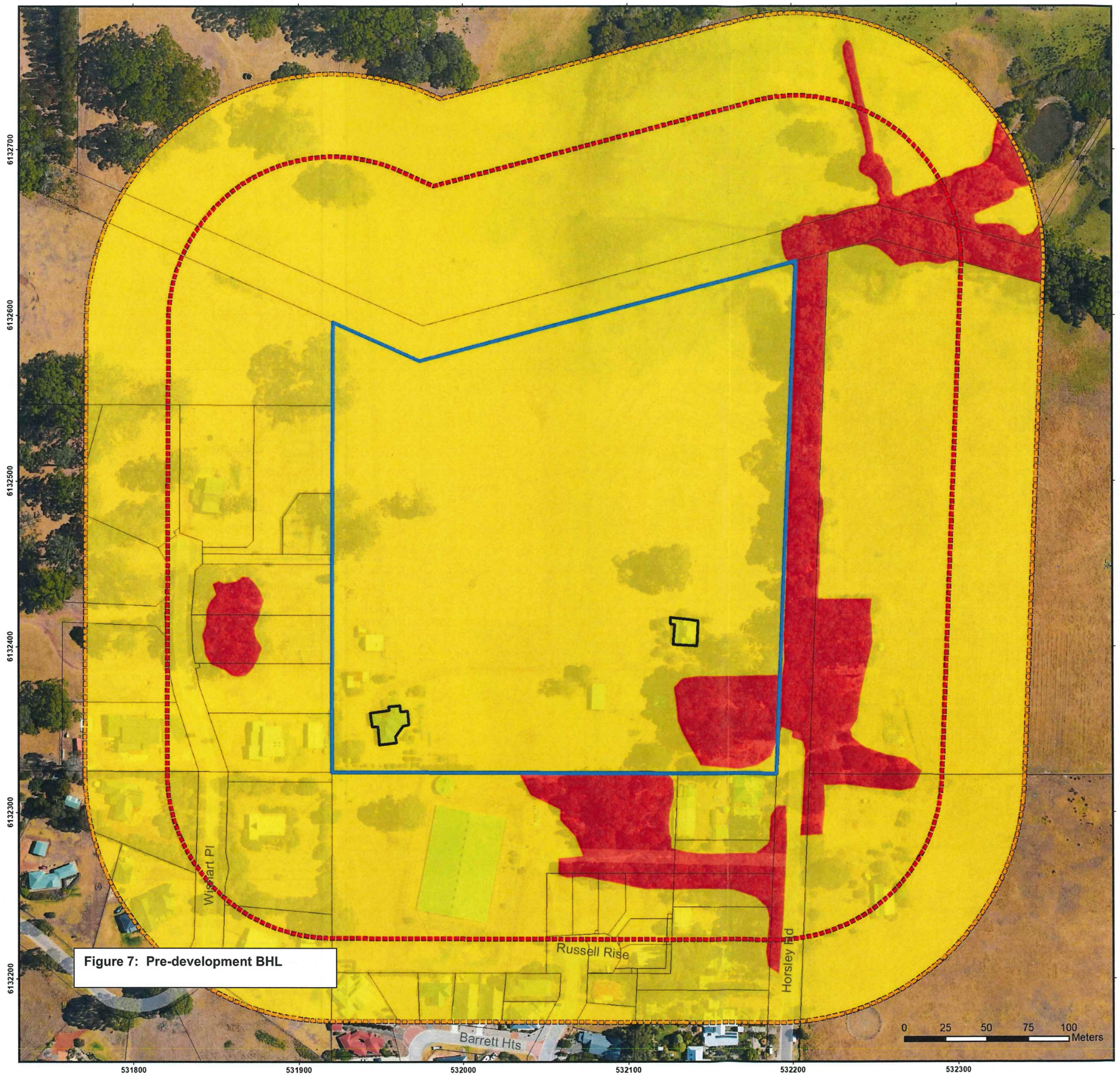


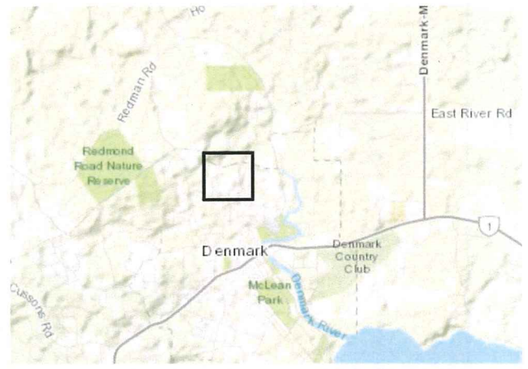
Figure 7: Pre-development BHL

This BAL Plan was prepared by:
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No: BPAD30794
Jurisdiction: Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

BIO DIVERSE SOLUTIONS

29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575



Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- Existing Dwelling

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale
1:2,250 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Williams Consulting Town Planning & Project Management
Lot 371 Horsley Road
Denmark, WA 6333

Pre Development Bushfire Hazard Level

BAL Assessor	*QA Check*	*Drawn by*
KK	**KK**	**BT**
STATUS	*FILE*	*DATE*
FINAL	**SWP008-002**	**31/01/2020**

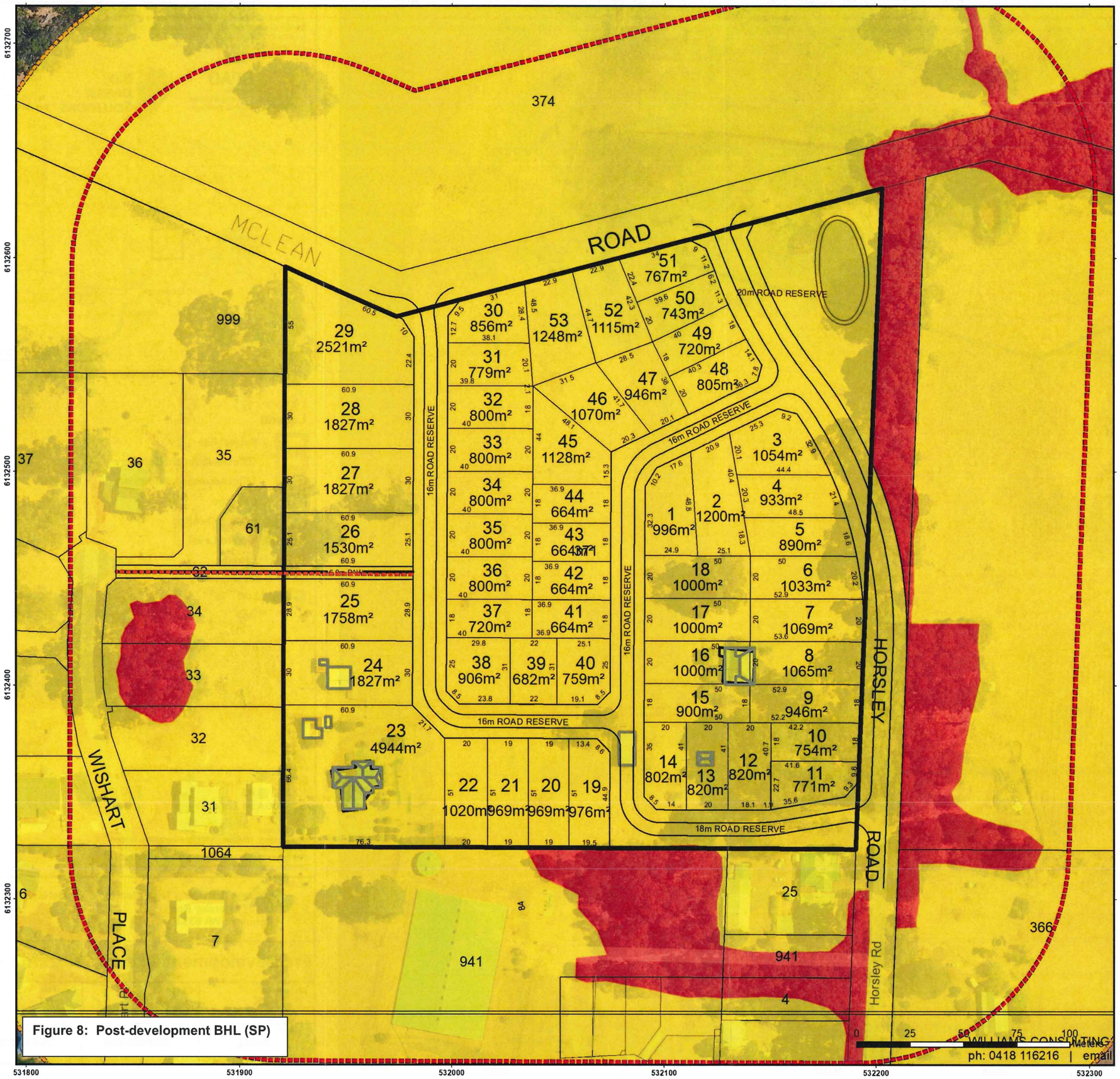


Figure 8: Post-development BHL (SP)

This BAL Plan was prepared by:
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No: BPAD30794
Jurisdiction: Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

BIO DIVERSE SOLUTIONS

29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- Existing Dwelling
- Proposed Future Road Layout
- Emergency Access Way

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale
1:1,750 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Williams Consulting Town Planning & Project Management
Lot 371 Horsley Road
Denmark, WA 6333

Post Development Bushfire Hazard Level

BAL Assessor	*QA Check*	*Drawn by*
KK	**JB**	**BT**
STATUS	*FILE*	*DATE*
FINAL	**SWP008-002**	**24/02/2020**

WILLIAMS CONSULTING
ph: 0418 116216 | email

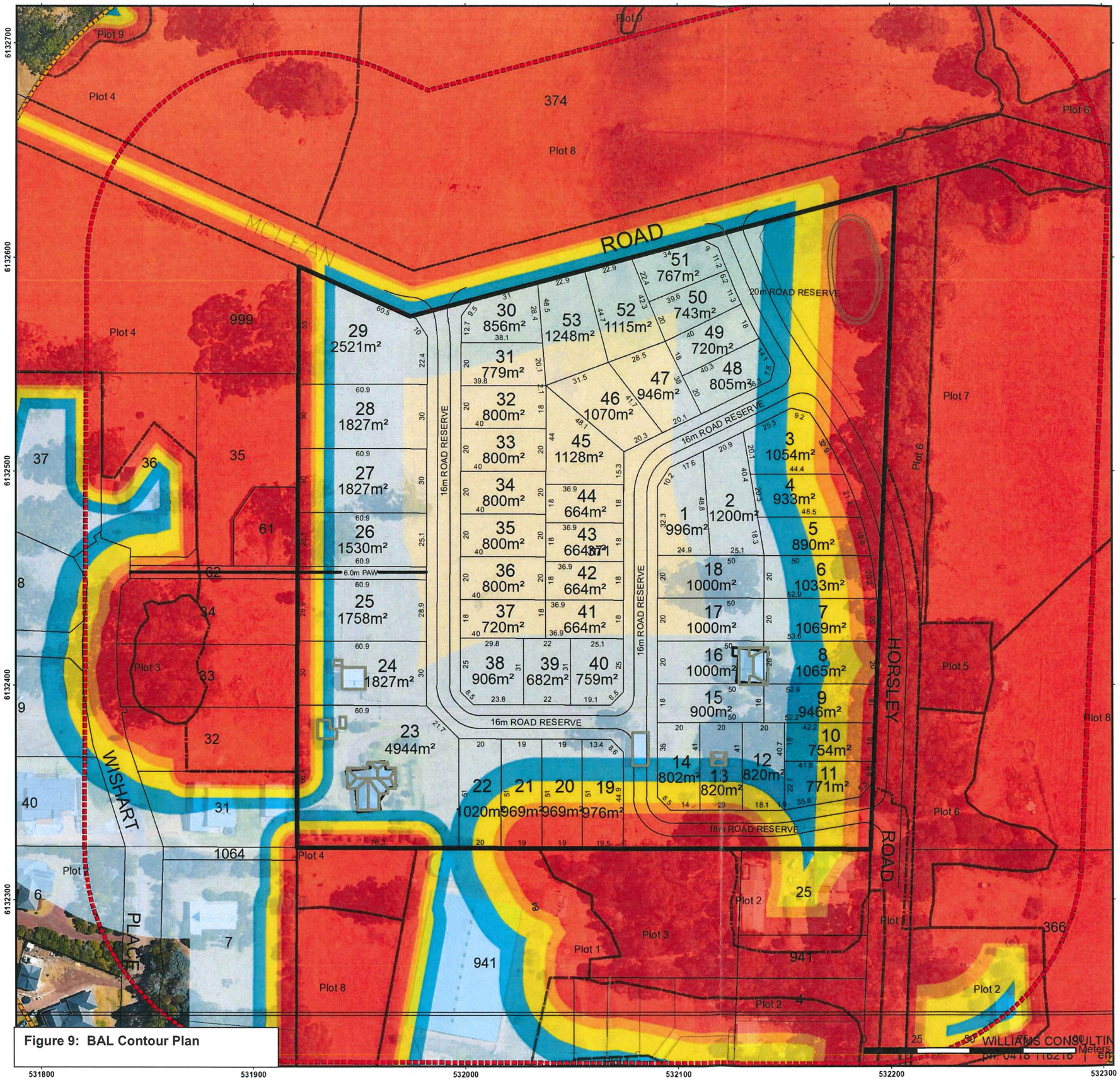


Figure 9: BAL Contour Plan

This BAL Plan was prepared by:
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No: BPAD30794
Jurisdiction: Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

BIO DIVERSE SOLUTIONS

29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575

Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- Existing Dwelling
- Vegetation/Plot Boundary

BAL Contours

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5
- BAL-LOW

Scale
1:1,750 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Williams Consulting Town Planning & Project Management
Lot 371 Horsley Road
Denmark, WA 6333

BAL Contour Plan

BAL Assessor	*QA Check*	*Drawn by*
KK	JB	CV
STATUS	*FILE*	*DATE*
FINAL	SWP008-002	24/02/2020

SECTION 4: Identification of Bushfire Impacts

The Bushfire threats associated with the subject site and development of the SP are the surrounding grassland vegetation internal to the site which has moderate slopes (>5-10 degrees). The grassed areas are presently heavily grazed (maximum of 50mm noted) which assists in reducing the fuel loads of the paddock areas. Internal in the south east there is a small stand of Marri trees which is also grazed. There is Forest Type A located to the east of the subject site in Horsley Road Reserve (unconstructed) and to the north west and south west in adjacent private properties.

Upon construction of the roads of Horsley Road and McLean Road separation from the lots in the SP to external bushfire risks will be mitigated through the external road reserves. Construction of the road reserves will also enable linking two-way access for the SP.

SECTION 5: Assessment to Bushfire Protection Criteria

The Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017) outlines bushfire protection criteria which subdivision and development proposals are assessed for compliance. The bushfire protection criteria (Appendix 4, WAPC, 2017) are performance-based criteria utilised to assess bushfire risk management measures and they outline four elements, being:

- Element 1: Location
- Element 2: Siting and Design of Development;
- Element 3: Vehicle Access; and
- Element 4: Water.

(WAPC, 2017)

The Plan of subdivision is required to meet the "Acceptable Solutions" of each Element of the bushfire mitigation measures (WAPC, 2017). The proposal has been assessed against the bushfire protection criteria Acceptable Solutions for Elements A1, A2, A3 and A4, refer to the assessment in Table 4.

Table 4: Bushfire protection criteria applicable to the site

Element	Acceptable Solution	Applicable or not Yes/No	Meets Acceptable Solution
Element 1 – Location	A1.1 Development Location	Yes	Compliant. As per SPP3.7 and the Guidelines for Planning in Bushfire Prone Areas, the Structure Plan (SP) (refer to Post Development BHL and BAL Contour Plan) and subsequent subdivision, will not be subject to a higher BHL than "Moderate". All new residential buildings can be located within a "Moderate/Low" BHL and/or have the ability to be located in an area that upon completion be able to achieve BAL 29 or lower (as per the BAL Contour Plan). It is noted McLean Road and Horsley will be constructed to the north and east (respectively) for this development. The subdivision of the subject site to 2 super lots enables each existing dwelling to achieve BAL 29 or less as demonstrated in the detailed BAL Assessments Appendix A and B. SP and 2-lot development are deemed compliant to Acceptable Solution A1.1
Element 2 – Siting and Design	A2.1 Asset Protection Zone	Yes	Compliant. An APZ can be applied and maintained within the (lots) and will be required to meet BAL 29 or less. APZ areas associated with BAL 29 or less are deemed to be achievable in the low fuel urban environment proposed on the SP (newly constructed roads to the north and east). Moderate BHL will prevail over the lots post development and all proposed new lots will have sufficient developable space to achieve an APZ of BAL 29 or lower meeting the acceptable solutions of the guidelines. APZ standards to be as per WAPC requirements, see Appendix C. If the subdivision is staged, the developer is to maintain balance of land in ownership in a low fuel condition in accordance with the Shire of Denmark Fire Management Notice and the WAPC APZ standards as stated in the provisions of this BMP. The existing house on Lot 2 (eastern house) requires a fence on the northern side to ensure BAL 29 or less applies as shown in the detailed BAL Assessment Appendix B. SP and 2-lot development are deemed compliant to Acceptable Solution A2.1
Element 3 – Vehicular Access	A3.1 Two Access Routes	Yes	Compliant. Access from the Subject Site for the SP will be via the extension of Horsley Road and future connections to the north west and north east along McLean Road. The proposed SP meets the requirement of linking two-way access. If the subdivision is staged then linking road reserves will need to be constructed or utilisation of the Public Access Way (PAW) to the west to Wishart Place could also be utilised if McLean Road is not developed due to staging. The super-lot (2 lot) development will have access along driveways to each single lot. As shown on the plan of subdivision (Figure 2). Access to the two existing houses is via driveways from Horsley Road from the south. There is existing driveway access to the site and is a legacy of the original development of the two dwellings on the lots. The 2-lot subdivision proposal is to separate titles to the allocated to the existing buildings (refer to Section 1 of this report). As there is no increase of persons or dwellings onto the lots from this subdivision proposal, the access is deemed to meet the requirements of the guidelines and a legacy from the building approvals for the existing dwellings. Horsley Road connects to the south to other destinations. SP and 2-lot development are deemed compliant to Acceptable Solution A3.1

Table 4 cont.

Element	Acceptable Solution	Applicable or not Yes/No	Meets Acceptable Solution
Element 3 – Vehicular Access	A3.2 Public Road	Yes	Compliant The extension of internal roads to McLean Road to the north and Horsley Road along the east will be required for the SP. All roads measure between 16m and 20m. The minimum technical requirements for public roads are outlined in Table 5, column 1. Engineering plans Public roads) for the SP are to ensure they meet these minimum technical requirements and are approved by the Shire prior to subdivision construction. The subdivision of the lot into 2 super lots does not require any public roads and therefore this is not assessed to A3.2. The SP is deemed compliant to Acceptable Solution A3.1
	A3.3 Cul-de-sacs	No	No cul-de-sacs are proposed. Not assessed to A3.3.
	A3.4 Battle axes	Yes	Compliant Battle axes are to be avoided in bushfire prone areas. The SP does not contemplate battle axes and is not assessed to this requirement. The 2-lot subdivision cannot avoid the development of a battle axe due to the limited constructed public road network to the north, west and south. As access is along the established driveways to existing dwellings this is deemed a legacy issue to the existing building approvals. There is no increase of persons or dwellings into the proposed 2-lot subdivision. The battle axe leg meets the minimum technical requirements of the guidelines being 9m wide and does not exceed 600m. The super lot (2 lot) subdivision development is deemed compliant to Acceptable Solution A3.4.
	A3.5 Private driveways	Yes	Compliant. A driveway is installed to the existing dwellings on both Lot 1 and 2 and noted to be to 4m trafficable surface and 6m horizontal clearance. Refer to photographic evidence from the site assessment, Appendix D. The existing driveway to Lot 1 (western lot) is approximately 285m long. As the driveway is >200m one passing bay is required to be installed by the owner (20m long 6m wide), refer to Figure 10. A driveway and turnaround area are installed at the house (refer to photographic evidence Appendix D) as per minimum technical requirements (Figure 11). Minimum technical requirements for driveways are to apply and are outlined in Table 5, column 2. Driveways (and crossovers) for the larger SP are to meet the same required standards and are to be approved by the Shire prior to construction. SP and 2- lot development are deemed compliant to Acceptable Solution A3.5.
	A3.6 Emergency Access Ways	No	No EAWs proposed as the public road network will be utilised. Not assessed to A3.6.

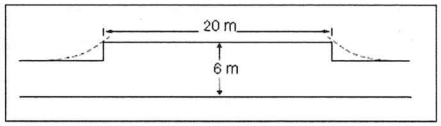
Table 4. cont.

Element	Acceptable Solution	Applicable or not Yes/No	Meets Acceptable Solution
	A3.7 Fire Service Access Ways	No	No FSA's proposed as the public road network will be utilised. Not assessed to A3.7.
	A3.8 Firebreaks	Yes	Compliant to SoD Fire Break Notice.
Element 4 – Water	A4.1 Reticulated areas	Yes	Compliant The existing dwellings are connected to reticulated scheme water and are fully compliant to A4.1. The SP development is to ensure all hydrants and reticulated water is connected during construction to WCWA standards *Water Corporation's No 63 Water Reticulation Standard* and approved by the Shire prior to construction. SP and 2- lot development are deemed compliant to Acceptable Solution A1.1
	A4.2 Non-reticulated areas	No	Not assessed to A4.2.
	A4.3 Individual lots in non-reticulated areas	No	Not assessed to A4.3.

Table 5: Vehicular Access Technical Requirements (WAPC, 2017)

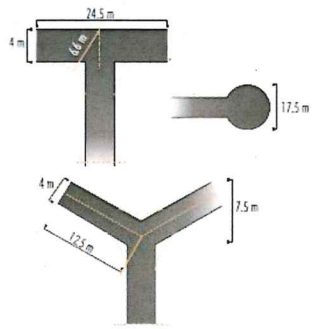
Technical requirements	Public Roads	Private Driveways & Battle Axes
Minimum trafficable surface (m)	6	4
Horizontal clearance (m)	6	6
Vertical clearance (m)	4.5	4.5
Maximum grades	1 in 10	1 in 10
Minimum weight capacity (t)	15	15
Maximum crossfall	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5

Figure 10: Passing bays for internal driveways> 200m.



Passing bay measurements.

Figure 11: Turnaround area minimum technical requirements (WAPC, 2017).



BIO DIVERSE SOLUTIONS

SECTION 6: IMPLEMENTATION ACTIONS

The responsibilities of the Landowners are shown in Table 5.

Table 5 – Implementation Actions

Developer 2 lot subdivision– Prior to issue of titles		
No	**Implementation Action – 2 lot subdivision**	**Completed**
1	Align northern fence line (or add a 5m wide gravel/limestone hardstand area as a firebreak) to lot 2 (eastern) dwelling to ensure an APZ area of a minimum of 10m in the north prevails over the dwelling. Refer to "Works Program" Mapping in Appendix B of this BMP report.	☐
2	Maintain individual APZ areas in a low fuel state as per WAPC APZ standards (Appendix C) at all times.	☐

Developer Structure Plan/Subdivision development			
N.	**Implementation Action**	**Subdivision application**	**Subdivision Clearance**
1	Provide an updated BAL Contour Plan at WAPC Subdivision application stages demonstrating BAL 29 or less is achieved over the proposed residential lots in developable areas.	✓	
2	Ensure prospective buyers are aware of the certified BAL Contour Plan and the applicable BAL to their property through provision of BAL Contour Plan. Update the BAL contour plan and provide certification of BAL Contour prior to lodgement of titles (post construction).		✓
3	Maintain balance of land in ownership in accordance with the Shire of Denmark Fire Management Notice and the WAPC APZ standards as stated in the provisions of the BMP.		**Ongoing**
4	Ensure access standards as outlined in Table 5 are outlined in detailed engineering drawings and approved by the Shire prior to subdivision construction.	✓	
5	Construct all vehicle access routes in the subdivision to the minimum standards as outlined in Table 4.		✓
6	Install reticulated water to WCWA standards installed in accordance with the *Water Corporation's No 63 Water Reticulation Standard.*		✓

SECTION 7: DISCLAIMER

The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959-2009 – Building in Bushfire Prone Areas, WAPC State Planning Policy 3.7 (WAPC, 2015), WAPC Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015), and CSIRO's research into Bushfire behaviour. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.

AS3959-2009 disclaimer: It should be borne in mind that the measures contained within this Standard (AS3959-2009) cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather condition. (AS3959, 2009)

Building to AS39590-2009 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself. (AS3959, 2009)

SECTION 8: Certification

I hereby certify that I have undertaken the assessment of the above site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS 3959-2009 (Incorporating Amendment Nos 1, 2 and 3) and the Guidelines for Planning in Bushfire Prone Areas Ver 1.3 (WAPC, 2017).

SIGNED, ASSESSOR: .. .. DATE: 24/02/2020

Kathryn Kinnear, Bio Diverse Solutions

Accredited Level 2 Bushfire Practitioner (Accreditation No: BPAD30794)

BIO DIVERSE SOLUTIONS

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

References

Western Australian Planning Commission (WAPC) (2017) Guidelines for Planning in Bushfire Prone Areas Version 1.3. Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.

Western Australian Planning Commission (WAPC) (2015) State Planning Policy 3.7 Planning in Bushfire Prone Areas. Department of Planning WA and Western Australian Planning Commission.

State Land Information Portal (SLIP) (2019) Map of Bushfire Prone Areas. Office of Bushfire Risk management (OBRM) data retrieved from:
https://maps.slip.wa.gov.au/landgate/bushfireprone/

Appendices

Appendix A – BAL Assessment Western House

Appendix B - BAL Assessment Eastern House

Appendix C - WAPC APZ standards to apply

Appendix D – Site evidence photographs

Appendix A

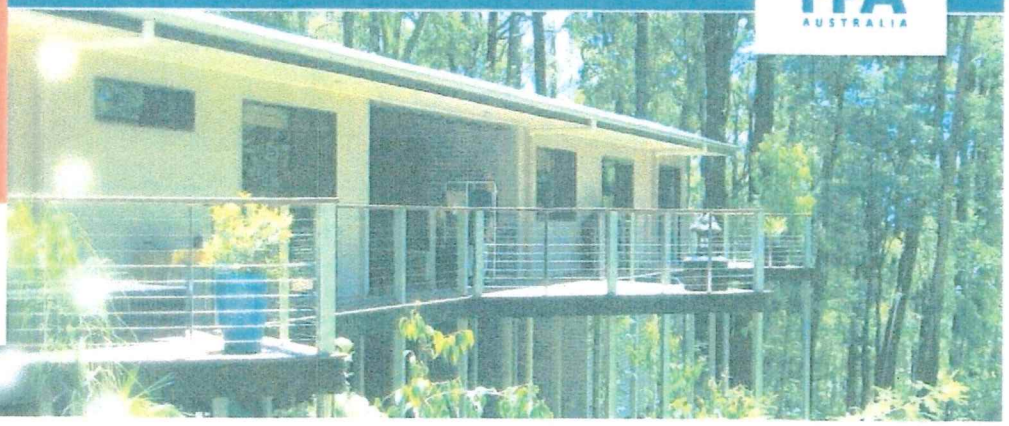
BAL Assessment Western House

BIO DIVERSE SOLUTIONS

Bushfire Attack Level Assessment Report

Prepared by a BPAD Accredited Practitioner

Fire Protection Association Australia Life Property Environment



AS 3959 BAL Assessment Report

This report has been prepared by an Accredited BPAD Practitioner using the Simplified Procedure (Method 1) as detailed in Section 2 of AS 3959 – 2009 (Incorporating Amendment Nos 1, 2 and 3). FPA Australia makes no warranties as to the accuracy of the information provided in the report. All enquiries related to the information and conclusions presented in this report must be made to the BPAD Accredited Practitioner.

Property Details and Description of Works

Address Details	**Unit no**	**Street no**	**Lot no** 371	**Street name / Plan Reference** Horsley Road (Proposed Lot 1 Western House)	
	Suburb Denmark			**State** WA	**Postcode** 6333
Local government area	Shire of Denmark				
Main BCA class of the building	Class 1a	**Use(s) of the building**	Habitable Building		
Description of the building or works	N/A Subdivision				

Report Details

Report / Job Number	Report Version	Assessment Date	Report Date
SWP008	FINAL	24 July 2018	27 July 2018

BPAD Accredited Practitioner Details

Steve Ayling BPAD 37379

Company Details
Bio Diverse Solutions
29 Hercules Crescent
Albany WA 6330.

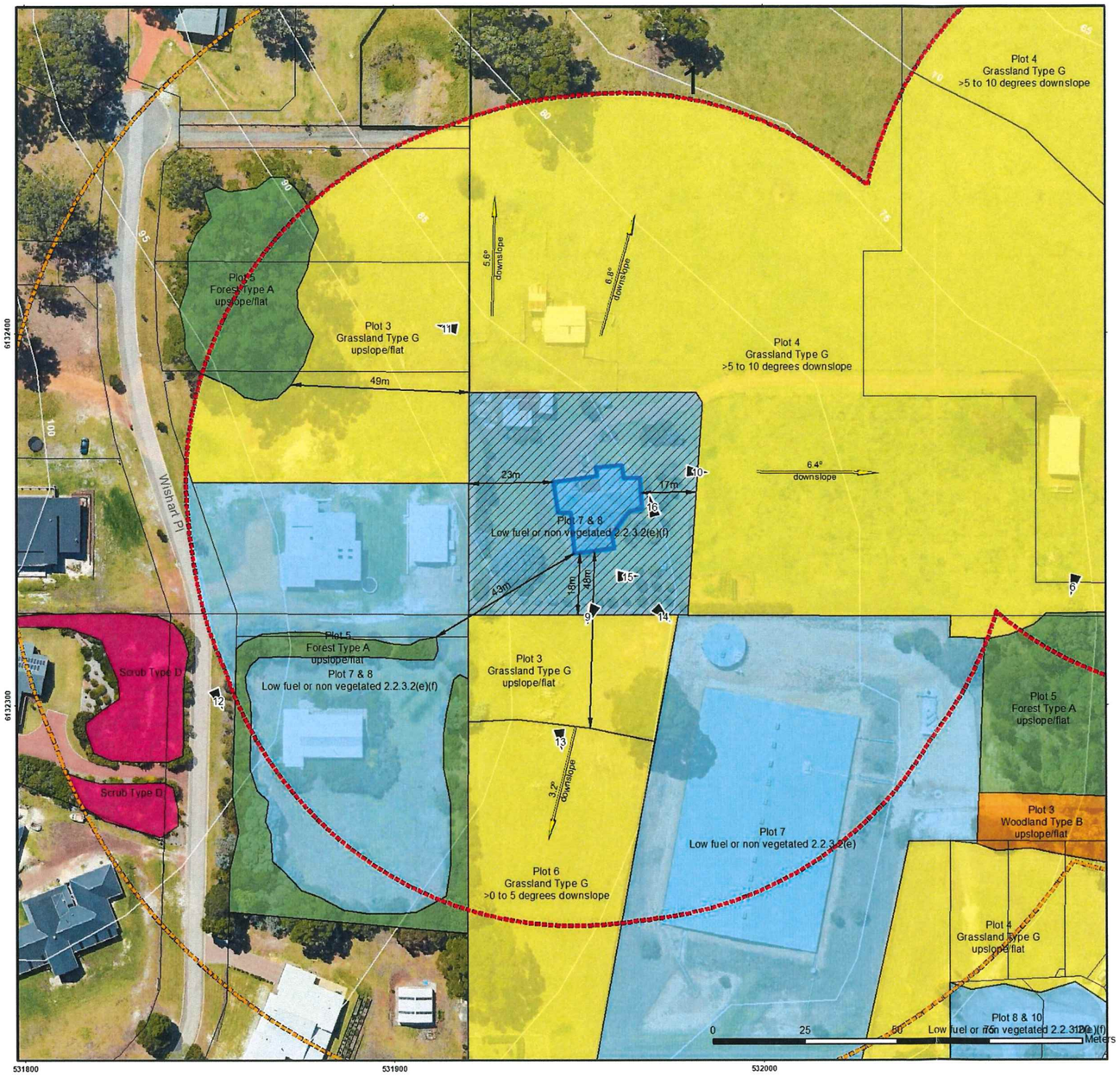
I hereby declare that I am a BPAD accredited bushfire practitioner.
Accreditation No. BPAD 37379
Signature
Date 30/07/18

Authorised Practitioner Stamp

Reliance on the assessment and determination of the Bushfire Attack Level contained in this report should not extend beyond a period of 12 months from the date of issue of the report. If this report was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report issued.

Site Assessment & Site Plans

The assessment of this site / development was undertaken on 24 July 2018 by a BPAD Accredited Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959 - 2009 Simplified Procedure (Method 1).



This BAL Plan was prepared by
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No: BPAD30794
Jurisdiction: Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 2

BIO DIVERSE SOLUTIONS

29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575

Overview Map Scale 1:100,000

Legend

- Subject Site
- APZ
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- Photo Point
- 5m Contours
- Slope Degrees
- Separation Distance

Vegetation

- Forest Type A
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2
- Scrub Type D
- Woodland Type B

Scale
1:1,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Sam Williams Planning
Lot 371 Horsley Road
Denmark WA 6333

Vegetation Classes - Lot 1

BAL Assessor	QA Check	Drawn by
SA	KK	SA
STATUS	**FILE**	**DATE**
FINAL	SWP008	24/07/2018

Vegetation Classification

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2009. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

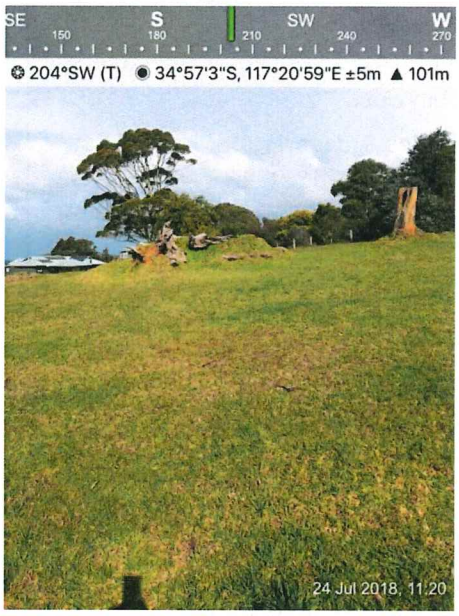
Photo ID: 9	**Plot:** 3	
Vegetation Classification or Exclusion Clause		
Class G Grassland – Sown pasture G-26		
Description / Justification for Classification		
Location: Located to the north west and south of subject site in grazed paddock areas. **Separation distance:** 23m to the north west, 18m to the south. **Dominant species & description:** Grazed paddocks consisting of Kikuyu. **Average vegetation height:** 55mm. **Vegetation Coverage:** <10% trees. **Available fuel loading:** 4.5 t/ha. **Effective slope:** Upslope. **Photo description:** View looking SSW from existing APZ.		

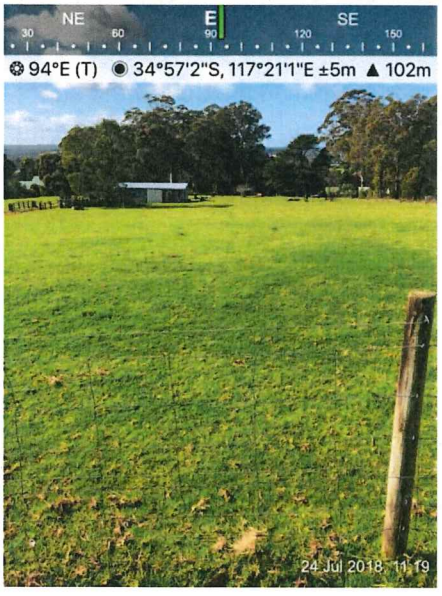
Photo ID: 10	**Plot:** 4	
Vegetation Classification or Exclusion Clause		
Class G Grassland – Sown pasture G-26		
Description / Justification for Classification		
Location: Located to the north and east of the subject site. **Separation distance:** 17m. **Dominant species & description:** Grazed paddocks consisting of Kikuyu. **Average vegetation height:** 50mm. **Vegetation Coverage:** <10% trees. **Available fuel loading:** 4.5 t/ha. **Effective slope:** Downslope >5-10 degrees. **Photo description:** View looking east through Plot 4.		

Photo ID:	11	Plot:	5

Vegetation Classification or Exclusion Clause

Class A Forest - Tall open forest A-01

Description / Justification for Classification

Location: Located to the north west and south west of the subject site.

Separation distance: 49m to the north west and 43m to the south west.

Dominant species & description: Karri forest, consisting of Karri, Sheoak, Acacia, Karri Hazel and Bracken. Multilayered.

Average vegetation height: 10–15m.

Vegetation Coverage: 30–70% foliage cover.

Available fuel loading: 15–25 t/ha.

Effective slope: Upslope.

Photo description: View of Forest Type A located to the north west of the subject site.

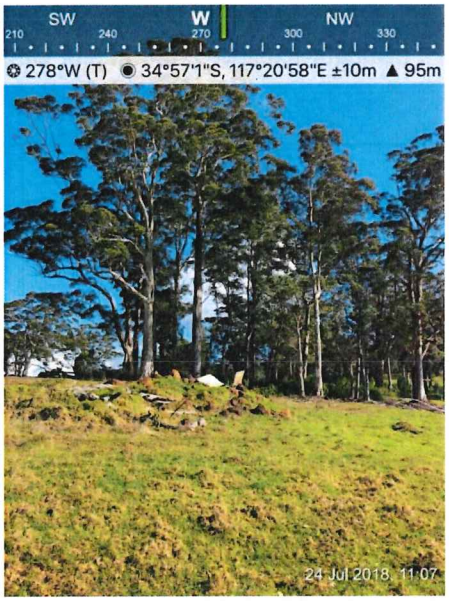


Photo ID:	12	Plot:	5

Vegetation Classification or Exclusion Clause

Class A Forest - Tall open forest A-01

Description / Justification for Classification

Location: Located to the north west and south west of the subject site.

Separation distance: 49m to the north west and 43m to the south west.

Dominant species & description: Planted screening vegetation consisting of Yate, Peppermints, Adenanthos, Acacia. Multilayered.

Average vegetation height: 10–15m.

Vegetation Coverage: 30–70% foliage cover.

Available fuel loading: 15–25 t/ha.

Effective slope: Upslope.

Photo description: View of Forest Type A located to the north west of the subject site.

Photo ID:	13	Plot:	6

Vegetation Classification or Exclusion Clause

Class G Grassland – Sown pasture G-26

Description / Justification for Classification

Location: Located to the south of the subject site.

Separation distance: 48m.

Dominant species & description: Grazed paddocks consisting of Kikuyu.

Average vegetation height: 50mm.

Vegetation Coverage: <10% trees.

Available fuel loading: 4.5 t/ha.

Effective slope: Downslope >0-5 degrees.

Photo description: View looking south through Plot 6.

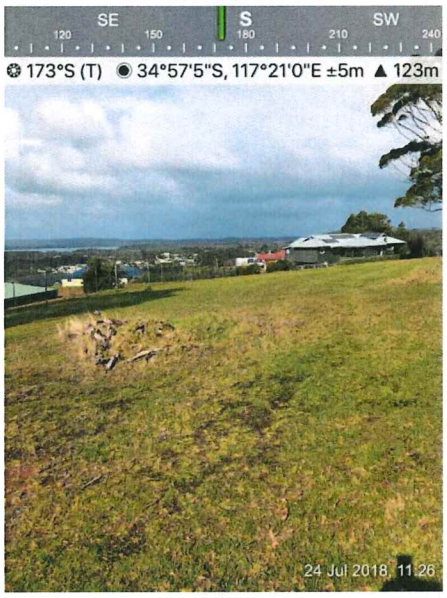


Photo ID:	14	Plot:	7

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(e) Non Vegetated Areas

Description / Justification for Classification

Location: Located to the south east, south west and west of the subject site including existing buildings and infrastructure.

Description: Buildings, driveways & roads.

As per exclusion clause 2.2.3.2 (e) of AS3959-2009.

Photo description: View southeast over Water Corporation infrastructure.

Photo ID:	15	Plot:	8

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(f) Low Threat Vegetation

Description / Justification for Classification

Location: Located to the south west and west of the subject site in APZ areas associated with existing dwellings.

Description: Maintained lawns, gardens & orchards associated with existing dwellings.

As per exclusion clause 2.2.3.2 (f) of AS3959-2009.

Available fuel loading: <2t/ha.

Photo description: View looking east through maintained orchard in adjacent property.

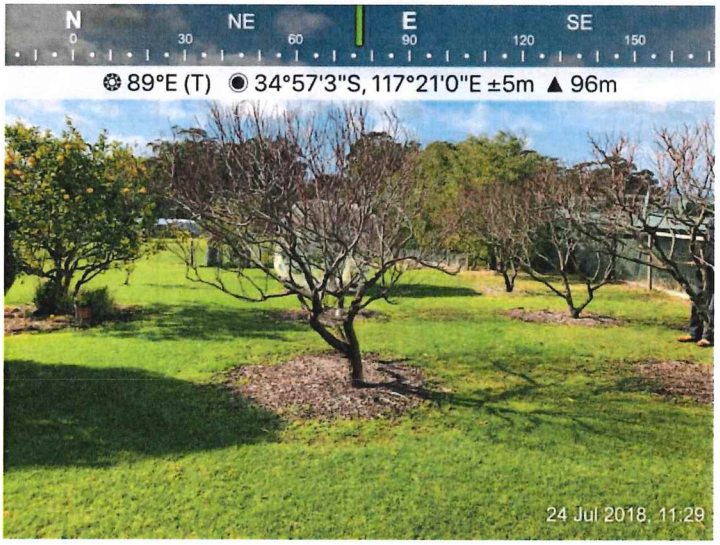


Photo ID:	16	Plot:	8

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(f) Low Threat Vegetation

Description / Justification for Classification

Location: Located to the south west and west of the subject site in APZ areas associated with existing dwellings.

Description: Maintained lawns & gardens associated with existing dwellings.

As per exclusion clause 2.2.3.2 (f) of AS3959-2009.

Available fuel loading: <2t/ha.

Photo description: View looking north depicting maintained gardens and lawns in the existing APZ.

Relevant Fire Danger Index

The fire danger index for this site has been determined in accordance with Table 2.1 or otherwise determined in accordance with a jurisdictional variation applicable to the site.

Fire Danger Index			
FDI 40 ☐	FDI 50 ☐	FDI 80 ☒	FDI 100 ☐
Table 2.4.5	*Table 2.4.4*	*Table 2.4.3*	*Table 2.4.2*

Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below.

Plot	Vegetation Classification	Effective Slope	Separation (m)	BAL
3	Class G Grassland	Upslope/flat	18m	BAL – 12.5
4	Class G Grassland	Downslope >5–10 degrees	17m	BAL – 19
5	Class A - Forest	Upslope/flat	43m	BAL – 12.5
6	Class G Grassland	Downslope >0–5 degrees	48m	BAL – 12.5
7	Excludable – Clause 2.2.3.2(e)	N/A	N/A	BAL – LOW
8	Excludable – Clause 2.2.3.2(f)	N/A	N/A	BAL – LOW

Table 1: BAL Analysis

Determined Bushfire Attack Level (BAL)

The Determined Bushfire Attack Level (highest BAL) for the site / proposed development has been determined in accordance with clause 2.2.6 of AS 3959-2009 using the above analysis.

Determined Bushfire Attack Level	**BAL – 19**

Appendix 1: Plans and Drawings

Plans and drawings relied on to determine the bushfire attack level		
Drawing / Plan Description N/A		
Job Number N/A	**Revision** N/A	**Date of Revision** N/A

Appendix 2: Additional Information / Advisory Notes

BAL Calculation is based on the "Method 1" of AS3959-2009. Separation distances were measured in the field to surface fuel loads with a Nikon Forestry Pro. Effective Slopes measured in the field with a Nikon Forestry Pro and verified with AHD contour analysis in GIS mapping. See Site Plan Page 2.

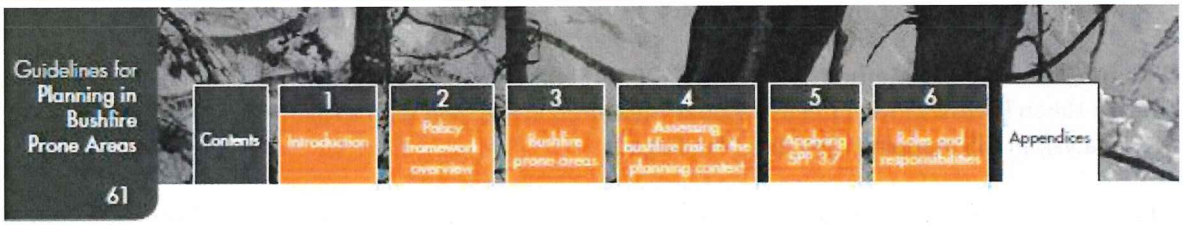
Refer to attached WAPC extract from the current and endorsed guidelines regarding an Asset Protection Zone (APZ) in Appendix 3. This is information for the lot owners regarding long -term maintenance of a lot/building in a bushfire prone area. All areas surrounding the building should be maintained as per APZ standards associated with the BAL setback assigned to the lot/building. Any setback associated to a BAL setback distance is to apply APZ **standards at all times**. Failure of the building owner to do so will void the BAL Assessment as defined in this document.

AS3959-2009 disclaimer
It should be borne in mind that the measures contained within this Standard (AS3959-2009) cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather condition.
(AS3959, 2009)

Building to AS39590-2009 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself.
(AS3959-2009)

DISCLAIMER
The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959-2009 – Building in Bushfire Prone Areas. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.

Appendix 3: Asset Protection Zone (APZ) to apply

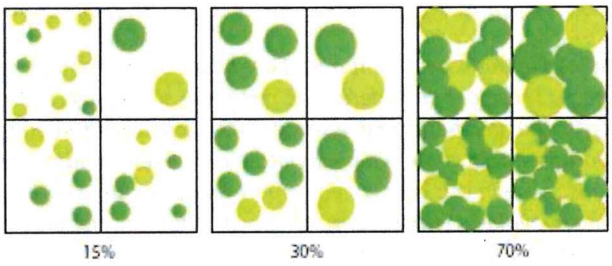


ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

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 16: 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 B

BAL Assessment Eastern House

BIO DIVERSE SOLUTIONS

Bushfire Attack Level Assessment Report

Prepared by a BPAD Accredited Practitioner

Fire Protection Association Australia Life Property Environment

AS 3959 BAL Assessment Report

This report has been prepared by an Accredited BPAD Practitioner using the Simplified Procedure (Method 1) as detailed in Section 2 of AS 3959 – 2009 (Incorporating Amendment Nos 1, 2 and 3). FPA Australia makes no warranties as to the accuracy of the information provided in the report. All enquiries related to the information and conclusions presented in this report must be made to the BPAD Accredited Practitioner.

Property Details and Description of Works

Address Details	**Unit no**	**Street no**	**Lot no** 371	**Street name / Plan Reference** Horsley Road (Proposed Lot 2, Eastern house)		
	Suburb Denmark				**State** WA	**Postcode** 6333
Local government area	Shire of Denmark					
Main BCA class of the building	Class 1a	**Use(s) of the building**		Habitable Building		
Description of the building or works	N/A Subdivision					

Report Details

Report / Job Number	Report Version	Assessment Date	Report Date
SWP008	FINAL	24 July 2018	27 July 2018

BPAD Accredited Practitioner Details

Steve Ayling BPAD 37379

Company Details
Bio Diverse Solutions
29 Hercules Crescent
Albany WA 6330.

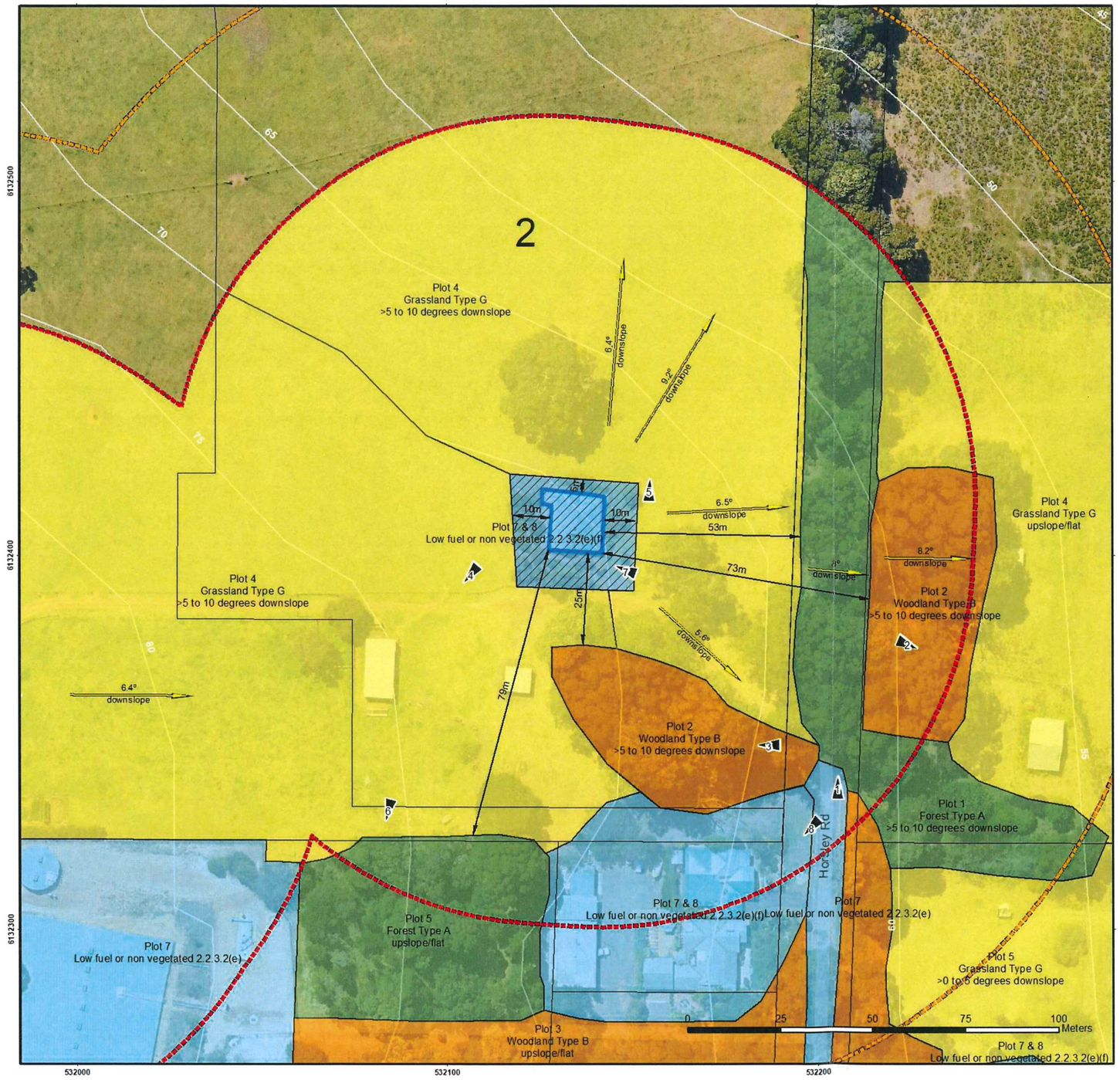
I hereby declare that I am a BPAD accredited bushfire practitioner.
Accreditation No. BPAD37379
Signature
Date 30/07/18

Authorised Practitioner Stamp

Reliance on the assessment and determination of the Bushfire Attack Level contained in this report should not extend beyond a period of 12 months from the date of issue of the report. If this report was issued more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report issued.

Site Assessment & Site Plans

The assessment of this site / development was undertaken on 24 July 2018 by a BPAD Accredited Practitioner for the purpose of determining the Bushfire Attack Level in accordance with AS 3959 - 2009 Simplified Procedure (Method 1).



This BAL Plan was prepared by:
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No: BPAD30794
Jurisdiction: Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 3
BIO DIVERSE SOLUTIONS
29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575

Overview Map Scale 1:100,000

Legend

- Subject Site
- APZ
- 100m Assessment Boundary
- 150m Assessment Boundary
- Cadastre
- Photo Point
- 5m Contours
- Slope Degrees
- Separation Distance

Vegetation

- Forest Type A
- Woodland Type B
- Scrub Type D
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2

Scale
1:1,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Sam Williams Planning
Lot 371 Horsley Road
Denmark WA 6333

Vegetation Classes - Lot 2

BAL Assessor	QA Check	Drawn by
SA	KK	SA
STATUS	**FILE**	**DATE**
FINAL	SWP008	24/07/2018

Vegetation Classification

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2009. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID: 1	**Plot:** 1	
Vegetation Classification or Exclusion Clause		
Class A Forest - Tall open forest A-01		
Description / Justification for Classification		
Location: Located to the east of the subject site in Shire managed road reserve (unconstructed). **Separation distance:** 53m. **Dominant species & description:** Karri Forest consisting of Karri, Marri, Watsonia, Bracken, Acacia, Melaleuca. Multilayered. **Average vegetation height:** 12–20m. **Vegetation Coverage:** >30-70% foliage cover. **Available fuel loading:** 25-35 t/ha. **Effective slope:** Downslope >5-10 degrees. **Photo description:** View of currently undeveloped right of way.		

Photo ID: 2	**Plot:** 2	
Vegetation Classification or Exclusion Clause		
Class B Woodland - Woodland B-05		
Description / Justification for Classification		
Location: Located to the east of the subject site in private property. **Separation distance:** 73m. **Dominant species & description:** Jarrah, Karri, Marri, grassy understory not multilayered. **Average vegetation height:** 12–20m. **Vegetation Coverage:** 10–30% foliage cover. **Available fuel loading:** 15–25 t/ha. **Effective slope:** Downslope >5-10 degrees. **Photo description:** View looking east through Plot 2 located to the east of the subject site.		

Photo ID:	3	Plot:	2

Vegetation Classification or Exclusion Clause

Class B Woodland - Woodland B-05

Description / Justification for Classification

Location: Located to the south and south east of the subject site.

Separation distance: 25m.

Dominant species & description: Jarrah, Karri, Marri, grassy understory not multilayered.

Average vegetation height: 12–20m.

Vegetation Coverage: 10–30% foliage cover.

Available fuel loading: 15–25 t/ha.

Effective slope: Downslope >5-10 degrees.

Photo description: View looking through Plot 2 to the south of the subject site.

Photo ID:	4	Plot:	3

Vegetation Classification or Exclusion Clause

Class G Grassland – Sown pasture G-26

Description / Justification for Classification

Location: Located to the south and west of the subject site in grazed paddock areas.

Separation distance: 10m.

Dominant species & description: Grazed paddocks consisting of Kikuyu.

Average vegetation height: 50mm.

Vegetation Coverage: <10% trees.

Available fuel loading: 4.5 t/ha.

Effective slope: Upslope.

Photo description: View southwest at house.

Photo ID:	5	Plot:	4

Vegetation Classification or Exclusion Clause

Class G Grassland – Sown pasture G-26

Description / Justification for Classification

Location: Located to the north of the subject site in grazed paddock areas.

Separation distance: 5m.

Dominant species & description: Grazed paddocks consisting of Kikuyu.

Average vegetation height: 50mm.

Vegetation Coverage: <10% trees.

Available fuel loading: 4.5 t/ha.

Effective slope: Downslope >5 -10 degrees.

Photo description: View of Plot 4 to the north.

Photo ID:	6	Plot:	5

Vegetation Classification or Exclusion Clause

Class A Forest - Tall open forest A-01

Description / Justification for Classification

Location: Located to the south of the subject site in adjacent private property.

Separation distance: 79m.

Dominant species & description: Karri forest consisting of Karri, Sheoak, Acacia, Karri Hazel, bracken, Leucopogon, multilayered.

Average vegetation height: 10–15m.

Vegetation Coverage: <30-70 % foliage cover.

Available fuel loading: 25-35 t/ha.

Effective slope: Upslope.

Photo description: View south east on southern boundary of the subject site.

Photo ID:	7	Plot:	7

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(e) Non Vegetated Areas

Description / Justification for Classification

Location: Located to the south and south west of the subject site in existing roads, pathways and established buildings.

Description: Buildings, driveways & roads.

As per exclusion clause 2.2.3.2 (e) of AS3959-2009.

Photo description: View of existing dwelling. Note maintained garden surrounding house.

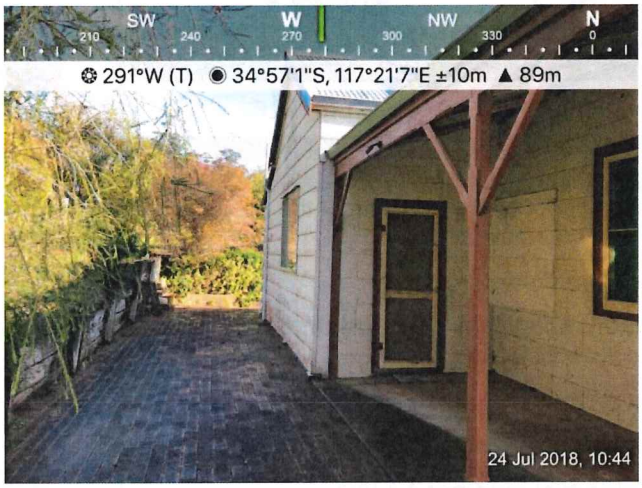


Photo ID:	8	Plot:	8

Vegetation Classification or Exclusion Clause

Excludable - 2.2.3.2(f) Low Threat Vegetation

Description / Justification for Classification

Location: Located to the south of the subject site.

Description: Maintained lawns & gardens associated with existing dwellings.APZ areas

As per exclusion clause 2.2.3.2 (f) of AS3959-2009.

Available fuel loading: <2t/ha.

Photo description: View of maintained gardens in adjacent residential dwelling to the south.

Relevant Fire Danger Index

The fire danger index for this site has been determined in accordance with Table 2.1 or otherwise determined in accordance with a jurisdictional variation applicable to the site.

Fire Danger Index			
FDI 40 ☐	FDI 50 ☐	FDI 80 ☒	FDI 100 ☐
Table 2.4.5	*Table 2.4.4*	*Table 2.4.3*	*Table 2.4.2*

Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below.

Plot	Vegetation Classification	Effective Slope	Separation (m)	BAL
1	Class A - Forest	Downslope 5–10 degrees	53m	BAL – 19
2	Class B Woodland	Downslope >5–10 degrees	25m	BAL – 29
3	Class G Grassland	Upslope/flat	10m	BAL – 29
4	Class G Grassland	Downslope >5–10 degrees	5m	BAL – FZ
5	Class A - Forest	Upslope/flat	79m	BAL – 12.5
7	Excludable – Clause 2.2.3.2(e)	N/A	N/A	BAL – LOW
8	Excludable – Clause 2.2.3.2(f)	N/A	N/A	BAL – LOW

Table 1: BAL Analysis

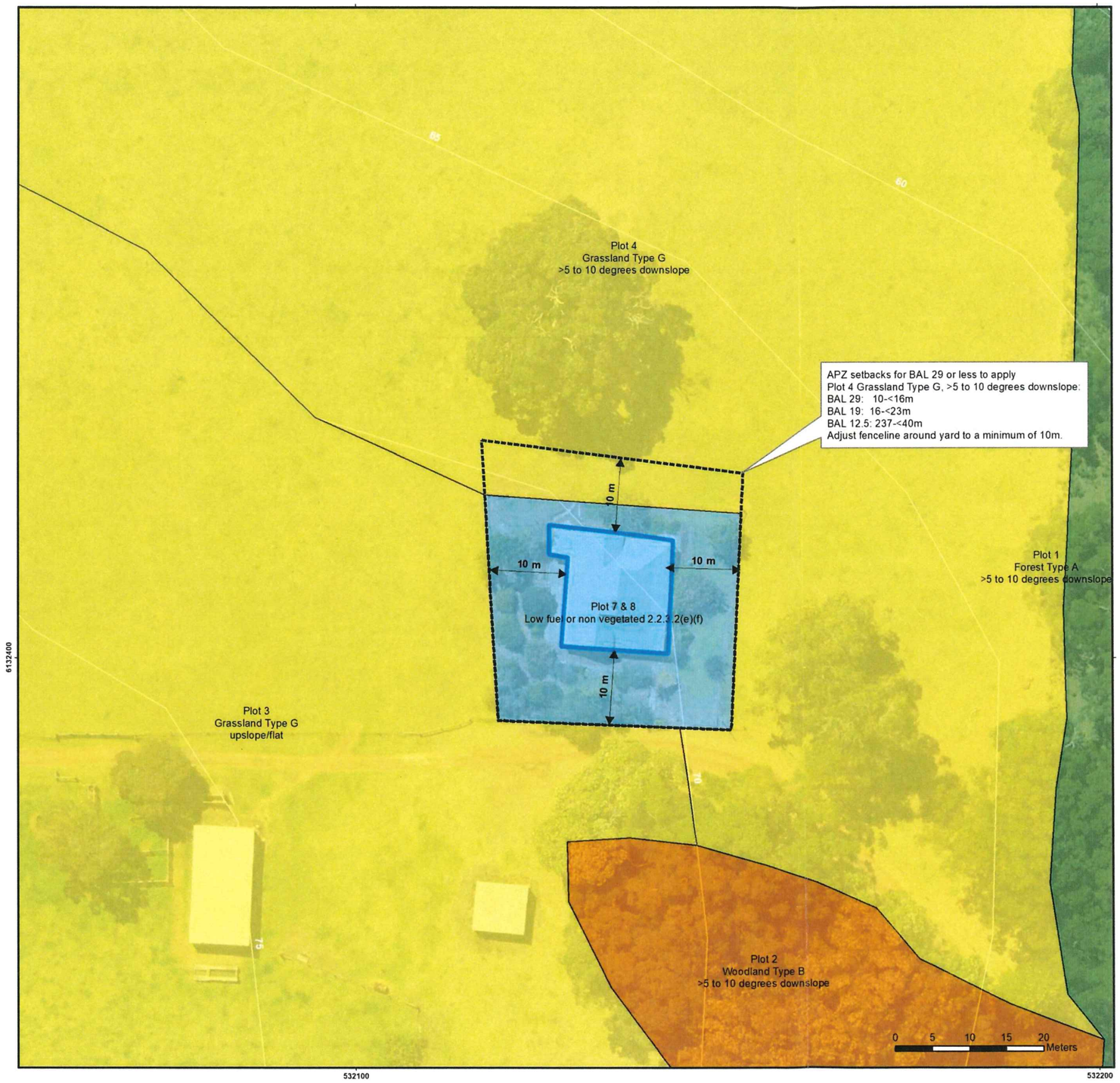
Determined Bushfire Attack Level (BAL)

The Determined Bushfire Attack Level (highest BAL) for the site / proposed development has been determined in accordance with clause 2.2.6 of AS 3959-2009 using the above analysis.

Determined Bushfire Attack Level	**BAL – FZ**

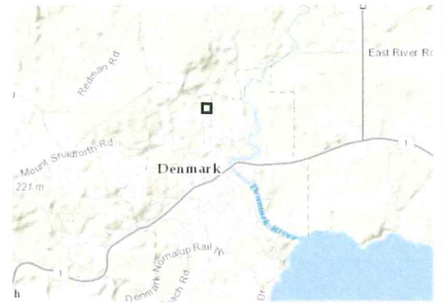
Note: the subject site (existing house) would be subject to BAL-29 if the house yard was extended to a 10m boundary.

Please refer to attached "Works Program" over the page showing an APZ area.



This BAL Plan was prepared by
Kathryn Kinnear, Bio Diverse Solutions
Accreditation No. BPAD30794
Jurisdiction Level 2 - WA

BPAD Bushfire Planning & Design Accredited Practitioner Level 2
BIO DIVERSE SOLUTIONS
29 Hercules Crescent
Albany, WA 6330
Australia
Tel: 08 9842 1575
Fax: 08 9842 1575



Overview Map Scale 1:100,000

Legend

- Subject Site
- Fuel Reduction to APZ setback
- 5m Contours

Vegetation

- Forest Type A
- Woodland Type B
- Scrub Type D
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2

Scale
1:500 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial Imagery: WA Now, Landgate Subscription Imagery
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT
Sam Williams Planning
Lot 371 Horsley Road
Denmark WA 6333

Works Program - Lot 2

BAL Assessor	*QA Check*	*Drawn by*
SA	**KK**	**SA**
STATUS	*FILE*	*DATE*
FINAL	**SWP008**	**24/07/2018**

Appendix 1: Plans and Drawings

Plans and drawings relied on to determine the bushfire attack level		
Drawing / Plan Description N/A		
Job Number N/A	**Revision** N/A	**Date of Revision** N/A

Appendix 2: Additional Information / Advisory Notes

BAL Calculation is based on the "Method 1" of AS3959-2009. Separation distances were measured in the field to surface fuel loads with a Nikon Forestry Pro. Effective Slopes measured in the field with a Nikon Forestry Pro and verified with AHD contour analysis in GIS mapping. See Site Plan Page 2.

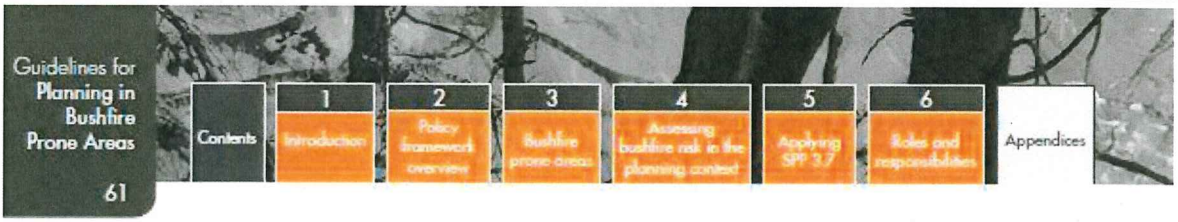
Refer to attached WAPC extract from the current and endorsed guidelines regarding an Asset Protection Zone (APZ) in Appendix 3. This is information for the lot owners regarding long -term maintenance of a lot/building in a bushfire prone area. All areas surrounding the building should be maintained as per APZ standards associated with the BAL setback assigned to the lot/building. Any setback associated to a BAL setback distance is to apply APZ **standards at all times**. Failure of the building owner to do so will void the BAL Assessment as defined in this document.

AS3959-2009 disclaimer
It should be borne in mind that the measures contained within this Standard (AS3959-2009) cannot guarantee that a building will survive a bushfire event on every occasion. This is substantially due to the unpredictable nature and behaviour of fire and extreme weather condition.
(AS3959, 2009)

Building to AS39590-2009 is a standard primarily concerned with improving the ability of buildings in designated bushfire prone areas to better withstand attack from bushfire thus giving a measure of protection to the building occupants (until the fire front passes) as well as to the building itself.
(AS3959-2009)

DISCLAIMER
The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959-2009 – Building in Bushfire Prone Areas. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.

Appendix 3: Asset Protection Zone (APZ) to apply

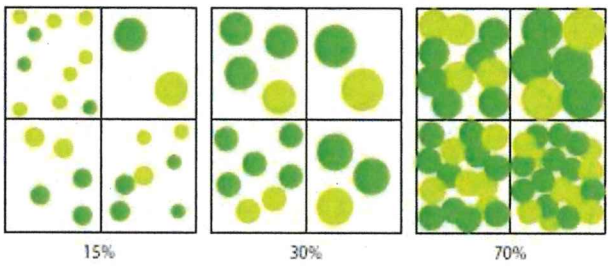


ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

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 16: 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.

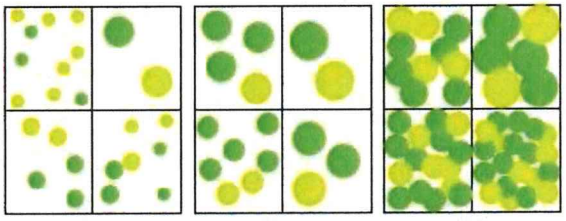
Appendix C

WAPC APZ standards to apply

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



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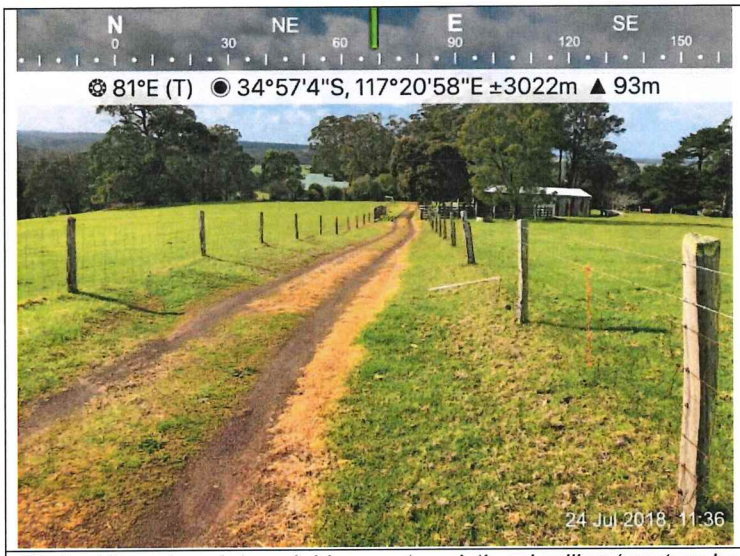
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Appendix D – Site evidence photographs

	Driveway noted to be inexistence to existing house, measures 285m from a public road.
Photo: View along internal driveway to existing dwelling (western house) off Horsley Road.	
	Existing turnaround area located at the front of Lot 1 dwelling. Meets WAPC requirements as per Figure 4.
Photo: View of existing turnaround area at Lot 1 (western house).	

Appendix C- Tree Survey

bayley environmental services

30 Thomas Street
South Fremantle 6162
bayley@iinet.net.au
T 08 9335 9160
F 08 9335 9160
M 0427 808 633
www.bayleyenvironmental.com.au

Our Ref: J18022

21 January 2019

Mr Sam Williams
Williams Consulting
PO Box 69
DENMARK WA 6333

Dear Sam

Tree Survey at 91 Horsley Rd, Denmark

Further to our discussions, I have examined the trees in the possible access road alignments at 91 Horsley Road, Denmark. At issue is a number of large Marri and Karri trees, which the owners wish to retain by altering the alignment of the access road on the structure plan.

The attached plan shows the structure plan and alternative access road overlain on an aerial photograph of the site. The alignments are approximate, based on the paper plans and advice you provided.

The plan shows that the current access road alignment (as per the structure plan) will result in the loss of one Marri and three Karri trees. These trees are all large mature specimens, measuring 0.9 – 1.2m diameter at breast height (dbh) and 20-30m in height. The Marri is known to be a favourite feeding tree for Baudin's Black Cockatoos. None of the trees contain visible hollows suitable for black cockatoo nesting.

Another two Marris and one Karri are located on the edge of the Horsley Road reserve immediately opposite the proposed access road. These may or may not be affected by the construction of Horsley Road, but would certainly be lost in the construction of the access road on this alignment.

The alternative alignment follows the southern boundary of the site for about 125m from Horsley Road, with a small dogleg at the Horsley Road end to accommodate 3m truncations. The alternative alignment contains eight trees in total:

- two pine trees – one Norfolk Island Pine and one possibly Pinaster Pine;
- two dead Marri stags;

- two Sheoaks about 5-8m tall;
- three 5m Peppermints, apparently planted; and
- one 2m juvenile Marri, apparently planted.

None of these trees has habitat significance (hollows etc.) and all except the two Sheoaks appear to have been planted.

Overall, the landscape and habitat values of the trees affected by the alternative alignment appear to be significantly less that that of those in the current alignment. Consequently, the alternative alignment would be preferred on ecological and landscape grounds.

The tree locations were recorded with a handheld GPS receiver, with variable accuracy due to the partial heavy canopy cover. The mapping was supplemented by aerial photography and ground observation, but the tree locations should be confirmed by accurate ground survey before the road alignment is finalised.

I trust the above is sufficient for your purposes. Please don't hesitate to contact me if you require any further information.

Yours sincerely
BAYLEY ENVIRONMENTAL SERVICES

Phil Bayley

PHIL BAYLEY

Figure 1

TREES IN ROAD ALIGNMENTS

bayley environmental services

Appendix D- Certificate of Title