

Date 17/06/2020

Our ref: 20PER-16368

Parcel Property
Level 3/14 Walters Dr,
Osborne Park,
WA 6017

RE: BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT REPORT FOR BRIGHTWOOD ESTATE, BALDIVIS

Site Details

Address: Lots 481, 482, 483, 484, 485, 486 and 668 Brightwood Estate, Baldivis

Suburb: Baldivis, 6171 **State:** Western Australia

Local Government Area: City of Rockingham

Description of building works: Future residential development

Report details

Report/Job number: 20PER-16382 **Report version:** v1

Assessment date: 10/06/2020 **Report date:** 17/06/2020

Author: James Leonard **Review:** Daniel Panickar
(BPAD Level 3-37802)



SITE ASSESSMENT AND SITE PLAN

The assessment of the subject lots was undertaken on 10 June 2020 for the purpose of determining the Bushfire Attack Level (BAL) in accordance with *Australian Standard AS 3959-2018 Construction of Buildings in Bushfire Prone Areas (SA 2018) Simplified Procedure (Method 1)*. An overview of the site is presented in Figure 1.

VEGETATION CLASSIFICATION

Vegetation within the subject site and surrounding 100 m (the assessment area) was assessed in accordance with AS 3959-2018 with regard given to the *Visual guide for bushfire risk assessment in Western Australia (DoP 2016)*. Each distinguishable vegetation class with the potential to determine the Bushfire Attack Level (BAL) is identified in Table 1 and presented in Figure 1. It has been assumed that

areas of landscaped vegetation and currently managed grassland within the whole assessment area will continue to be managed and maintained by respective landowners.

Table 1: Vegetation classification

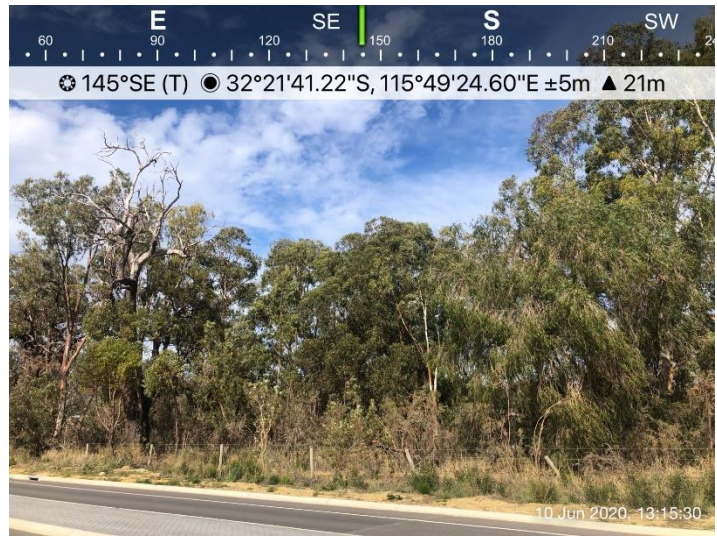
Plot	Classification or Exclusion Clause	Class B woodland
1	<p>Photo Point 1</p> <p>Classified vegetation within this plot is comprised of trees between 10 to 30 m tall with approximately 20 to 30% foliage cover. There is limited surface litter. Some grass and shrubs are present at the base of the trees.</p> <p>Slope under the vegetation has been assessed as upslope/ flat land.</p>	
1	<p>Photo Point 2</p> <p>Classified vegetation within this plot is comprised of trees between 10 to 30 m tall with approximately 20 to 30% foliage cover. There is limited surface litter. Some grass and shrubs are present at the base of the trees.</p> <p>Slope under the vegetation has been assessed as upslope/ flat land.</p>	

Plot 2 Classification or Exclusion Clause Class B woodland

Photo Point 3

Classified vegetation within this plot is comprised of trees between 10 to 30 m tall with approximately 20 to 30% foliage cover. There is limited surface litter. Some grass and shrubs are present at the base of the trees.

Slope under the vegetation has been assessed as Downslope>5 to 10 degrees



Plot 3 Classification or Exclusion Clause Class G grassland

Photo Point 4

Classified vegetation within this plot is predominantly grassland with foliage cover from the over storey less than 10%.

Slope under the vegetation has been assessed as upslope/ flat land.



Plot 4 Classification or Exclusion Clause Excluded under clause 2.2.3.2 (e) and (f)

Photo Point 5

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This is an area that has been cleared for development.



Plot 4 Classification or Exclusion Clause Excluded under clause 2.2.3.2 (e) and (f)

Photo Point 6

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This is an area of low threat vegetation, comprised of maintained grassland, public reserves and landscaping.



Plot 4 Classification or Exclusion Clause Excluded under clause 2.2.3.2 (e) and (f)

Photo Point 7

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This is a predominantly non-vegetated area with maintained road verges.



Figure 1: Vegetation classification



- Legend**
- Lots
 - 100m Assessment Area
 - Photo locations
 - Contours 5m Intervals (Statewide)

- Vegetation classification**
- Class B woodland
 - Class G grassland
 - Excluded under clause 2.2.3.2 (e) and (f)

0 20 40 80
Metres
Datum/Projection:
GDA 1994 MGA Zone 56

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Prepared by: JL Date: 17/06/2020

RELEVANT FIRE DANGER INDEX

The Fire Danger Index (FDI) for this site has been determined in accordance with Table 2.1 of AS 3959-2018. The FDI for WA is FDI 80.

POTENTIAL BUSHFIRE IMPACTS

The potential bushfire impact to the site/ proposed development from each of the identified vegetation plots are identified below in Table 2 and Figure 2.

Table 2: BAL Analysis AS 3959-2018

Plot	Vegetation Classification	Effective Slope	Separation distances required				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class B Woodland	All upslopes and flat land (0 degrees)	<10	10-<14	14-<20	20-<29	29-<100
2	Class B Woodland	Downslope >5 to 10 degrees	<16	16-<22	22-<31	31-<43	43-<100
3	Class G Grassland	All upslopes and flat land (0 degrees)	<6	6-<8	8-<12	12-<17	17-<50
4	Excluded AS 3959-2018 2.2.3.3 (e) & (f)	-	No separation distances required – BAL-LOW				

DETERMINED BUSHFIRE ATTACK LEVEL (BAL)

The determined Bushfire Attack Level (highest BAL) for the subject lots are shown in Table 3 and Figure 2. The BAL ratings have been determined in accordance with Clause 2.2.6 of AS 3959-2018 using relevant data from the site assessment.

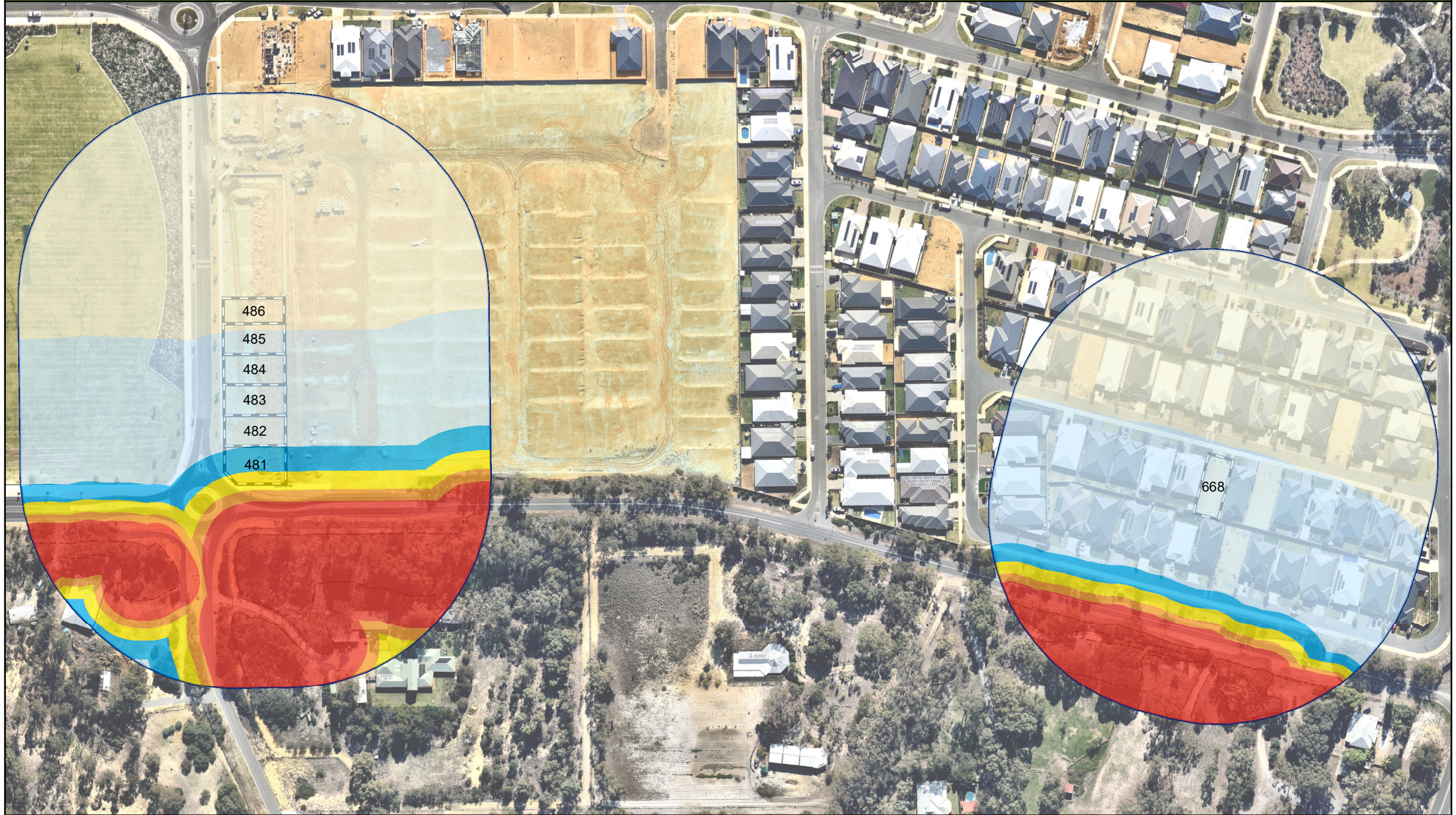
Table 3: BAL Assessment summary

BAL	Affected lots	Construction sections to be consulted in AS 3959-2018
BAL-FZ	Nil	N/A
BAL-40	Nil	N/A
BAL-29	Determined Bushfire Attack Level for: Lots 481	3 and 7
BAL-19	Nil	N/A
BAL-12.5	Determined Bushfire Attack Level for: Lots 482, 483, 484, 485 and 668	3 and 5
BAL-LOW	Determined Bushfire Attack Level for: Lots 486	4

*INDICATES THAT A SETBACK MAY BE ABLE TO REDUCE THE BAL RATING FOR A FUTURE DWELLING

This BAL rating is based on the information current at the date of this document and is valid for 12 months.

Figure 2: Bushfire Attack Level (BAL) Assessment



486
485
484
483
482
481

668

Legend

- Lots
- 100m Assessment Area
- Bushfire hazard interface

Bushfire Attack Level (BAL) Contour

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

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 GDA 1994 MGA Zone 56

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 Prepared by: JL Date: 17/06/2020

Appendix A – Additional Information / Advisory Notes

Bushfire Attack Level (BAL) as set out in the Australian Standard 3959 Construction of Buildings in Bushfire-Prone Areas (AS 3959), as referenced in the Building Code of Australia.

Bushfire Attack Level (BAL)	Classified vegetation within 100 m of the site and radiant heat flux exposure thresholds	Description of predicted bush fire attack and levels of exposure	Construction Section as per AS 3959
BAL-LOW		There is insufficient risk to warrant specific construction requirements.	4
BAL-12.5	$\leq 12.5 \text{ kW/m}^2$	Ember attack	3 and 5
BAL-19	$>12.5 \text{ kW/m}^2 \leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux.	3 and 6
BAL-29	$>19 \text{ kW/m}^2 \leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux	3 and 7
BAL-40	$>29 \text{ kW/m}^2 \leq 40 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux with the increased likelihood of exposure to flames.	3 and 8
BAL-FZ	$>40 \text{ kW/m}^2$	Direct exposure to flames from fire front in addition to radiant heat flux and ember attack	3 and 9

Source: “AS 3959 - 2018 Construction of buildings in bushfire-prone areas” published by Standards Australia, Sydney

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 481, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Downslope >5 to 10 degrees	25 m	BAL - 29

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

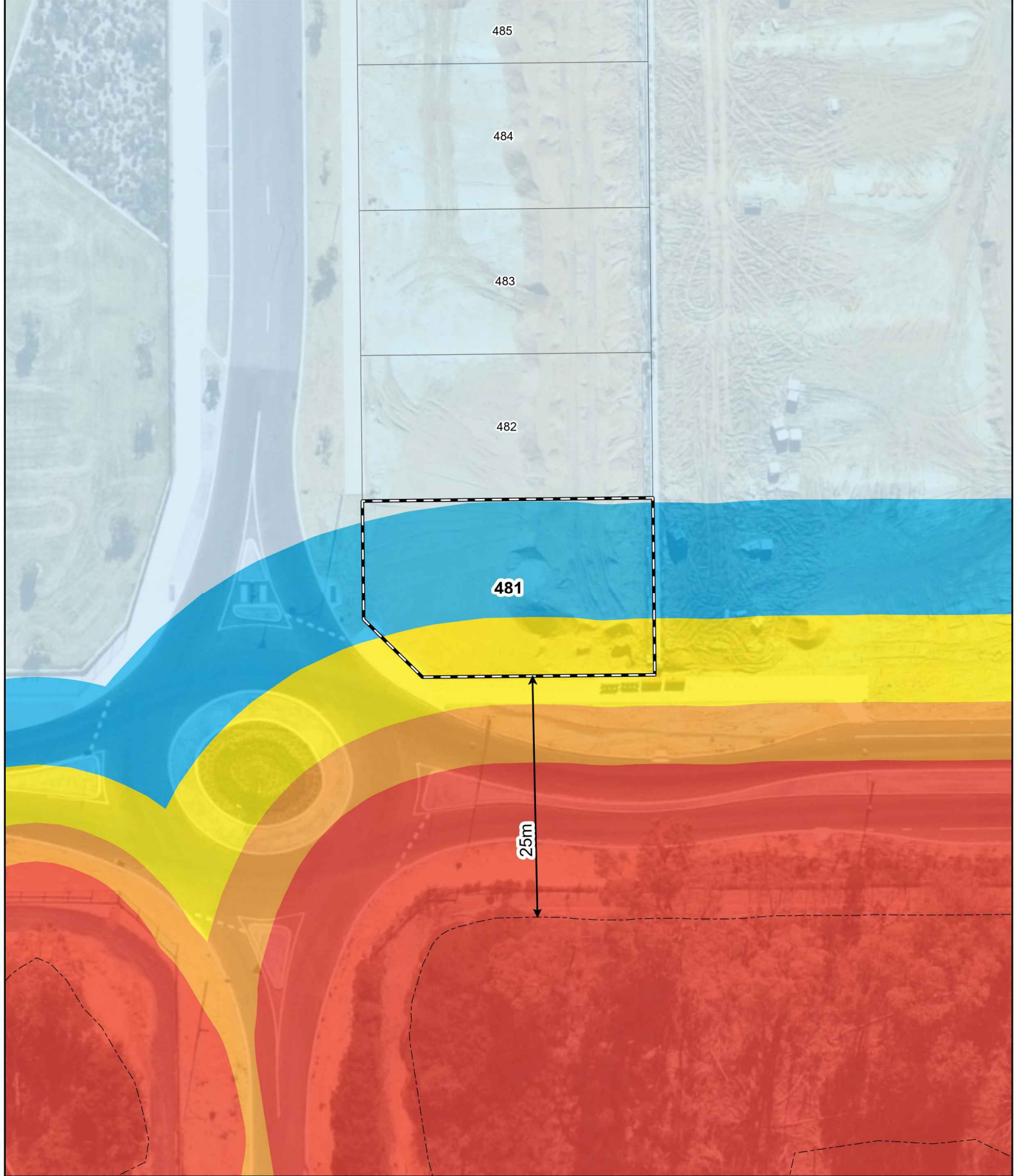
Signature: 

Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 481 (*BAL - 29)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location *Intersects multiple BAL contours
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



0 4 8 16
Metres
Datum/Projection:
GDA 1994 MGA Zone 50



Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 482, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Downslope >5 to 10 degrees	43 m	BAL - 12.5

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

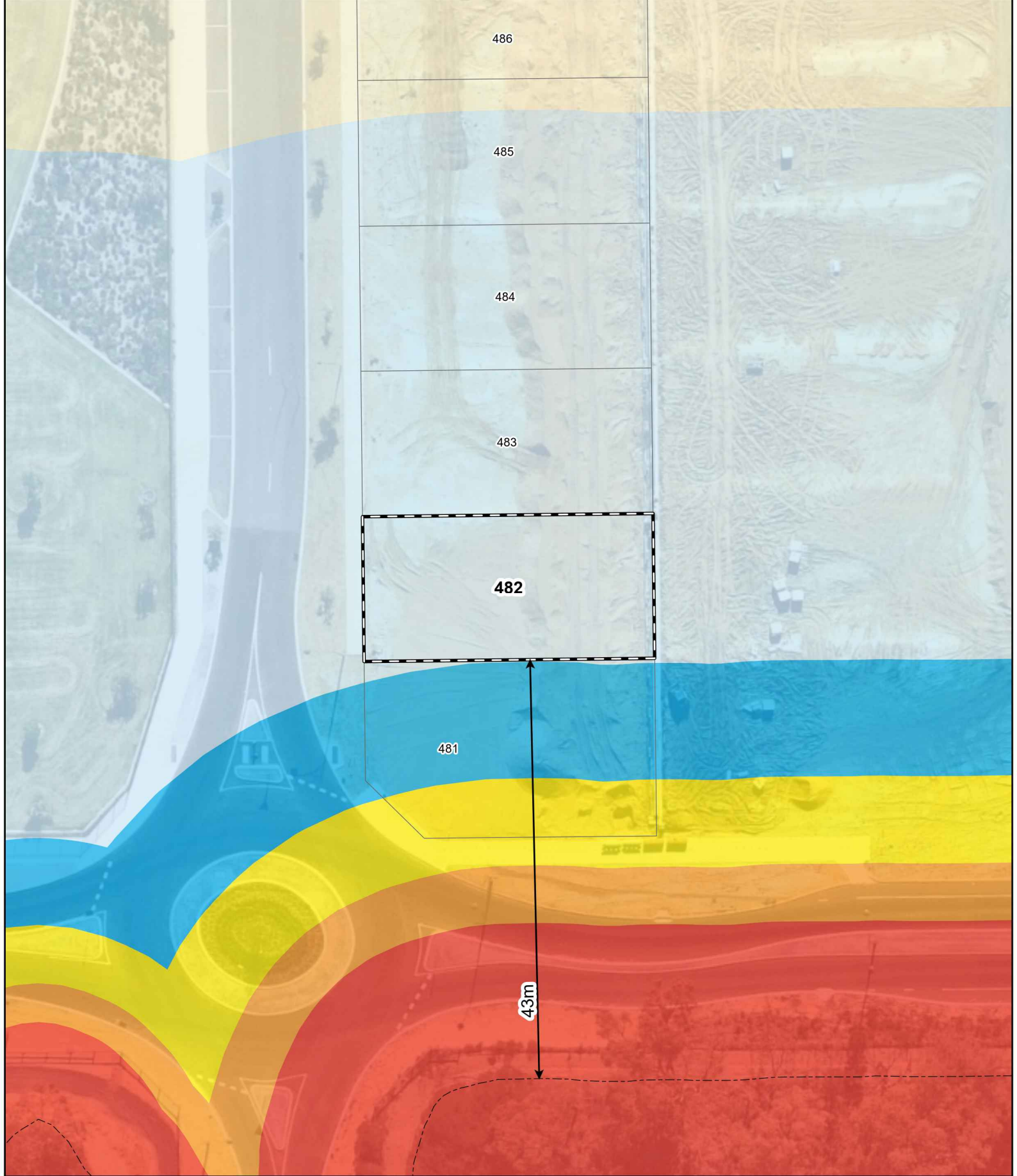
Signature: 

Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 482 (BAL - 12.5)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



0 4 8 16
Metres
Datum/Projection:
GDA 1994 MGA Zone 50



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Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 483, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Downslope >5 to 10 degrees	58 m	BAL - 12.5

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

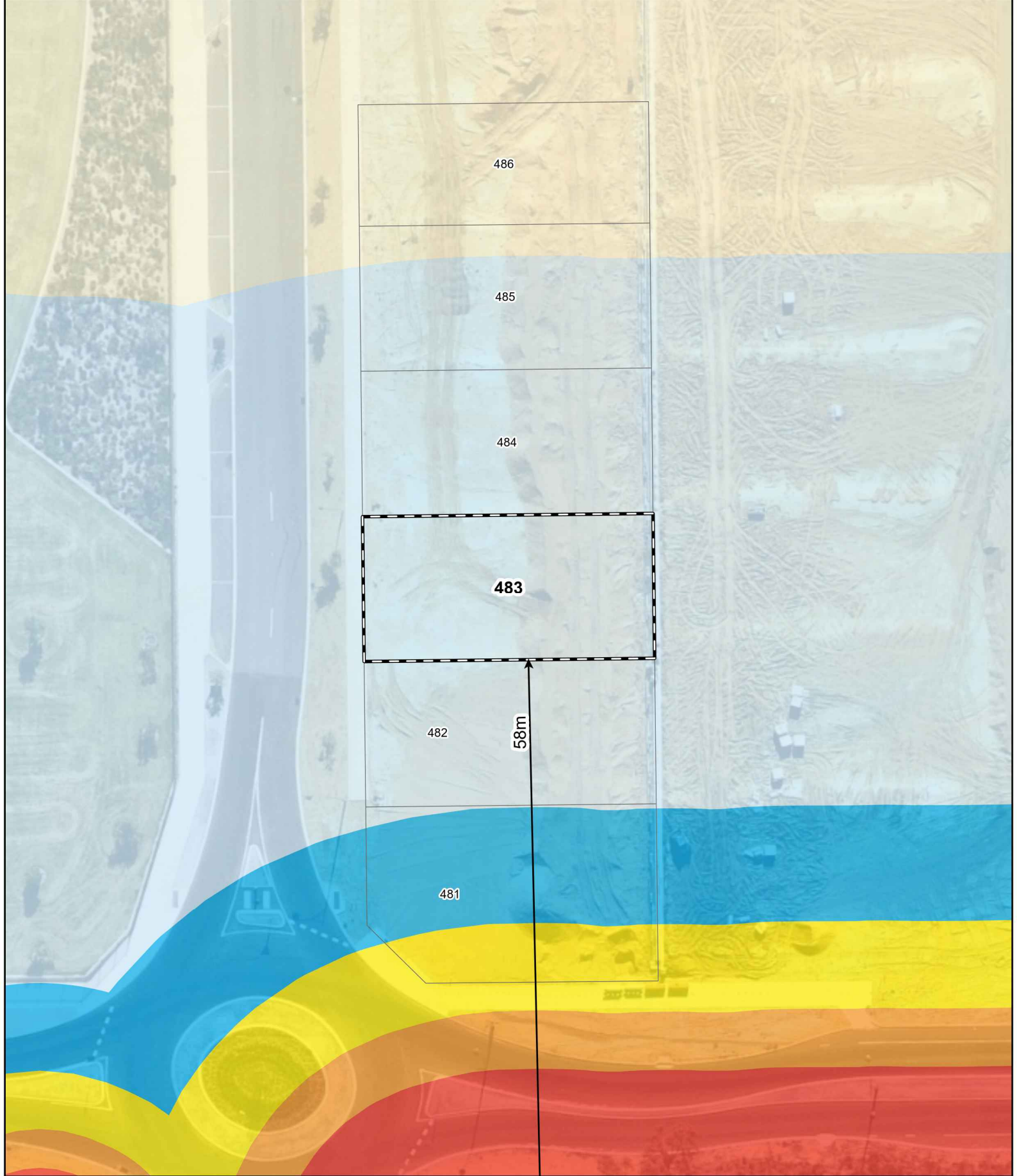
Signature: 

Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 483 (BAL - 12.5)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



0 4 8 16
Metres
Datum/Projection:
GDA 1994 MGA Zone 50



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Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 484, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Downslope >5 to 10 degrees	73 m	BAL - 12.5

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

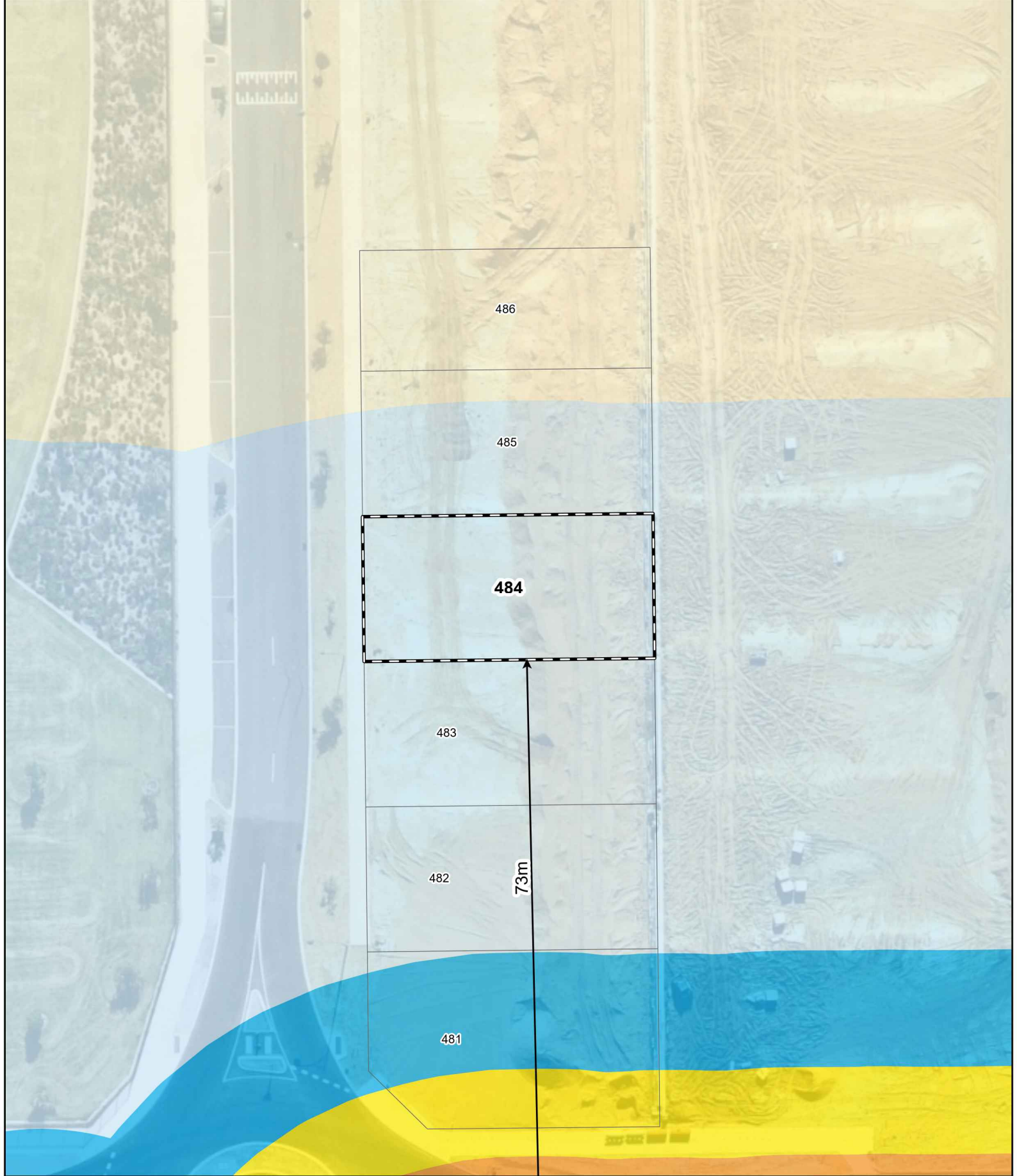
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Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

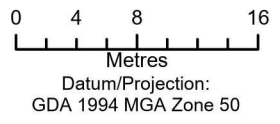
Figure : Bushfire Attack Level (BAL) Contours - Lot 484 (BAL - 12.5)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 485, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Downslope >5 to 10 degrees	88 m	BAL - 12.5

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

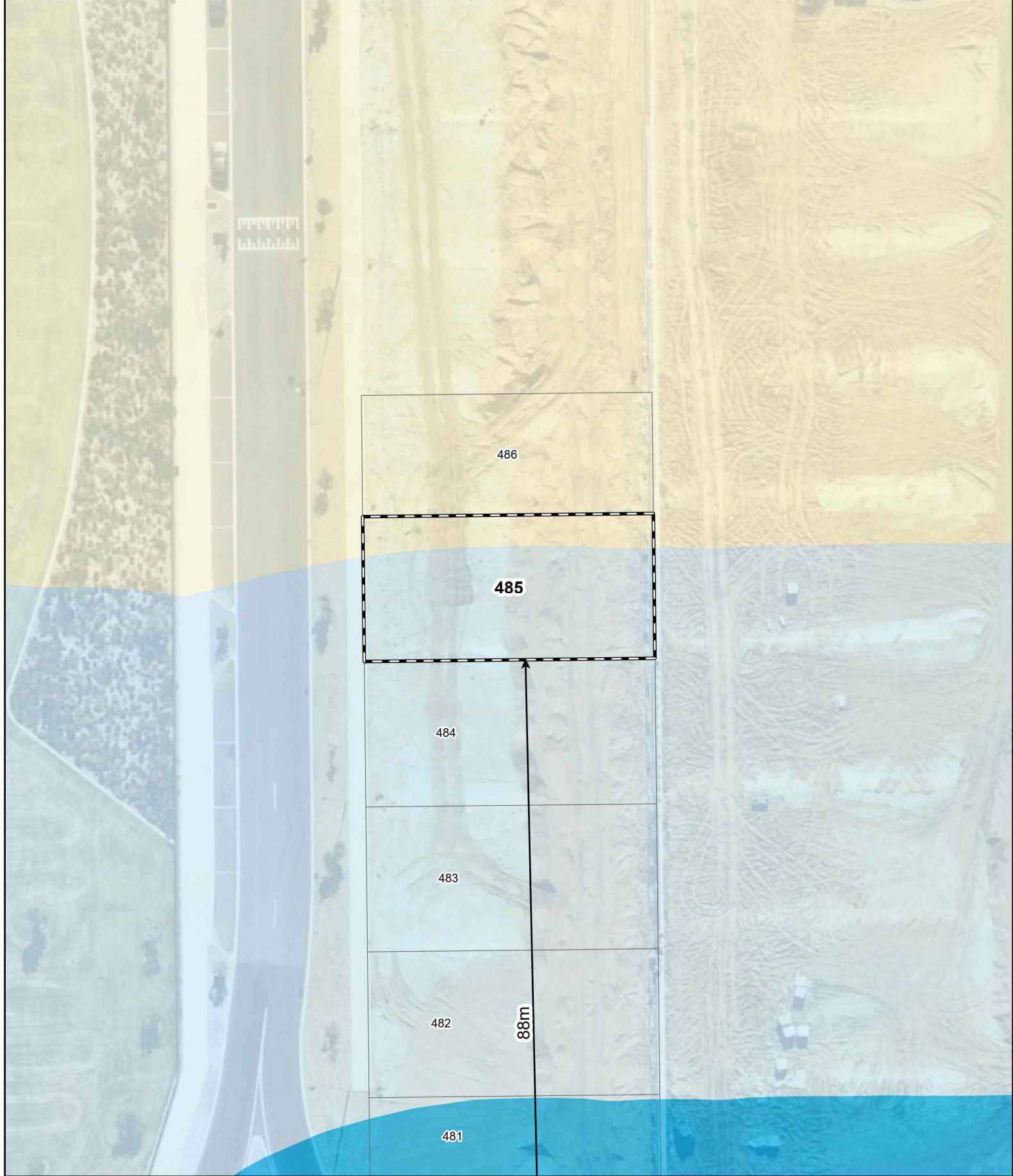
Signature: 

Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 485 (*BAL - 12.5)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location *Intersects multiple BAL contours
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



0 4 8 16
Metres
Datum/Projection:
GDA 1994 MGA Zone 50



Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 486, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Downslope >5 to 10 degrees	103 m	BAL - LOW

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

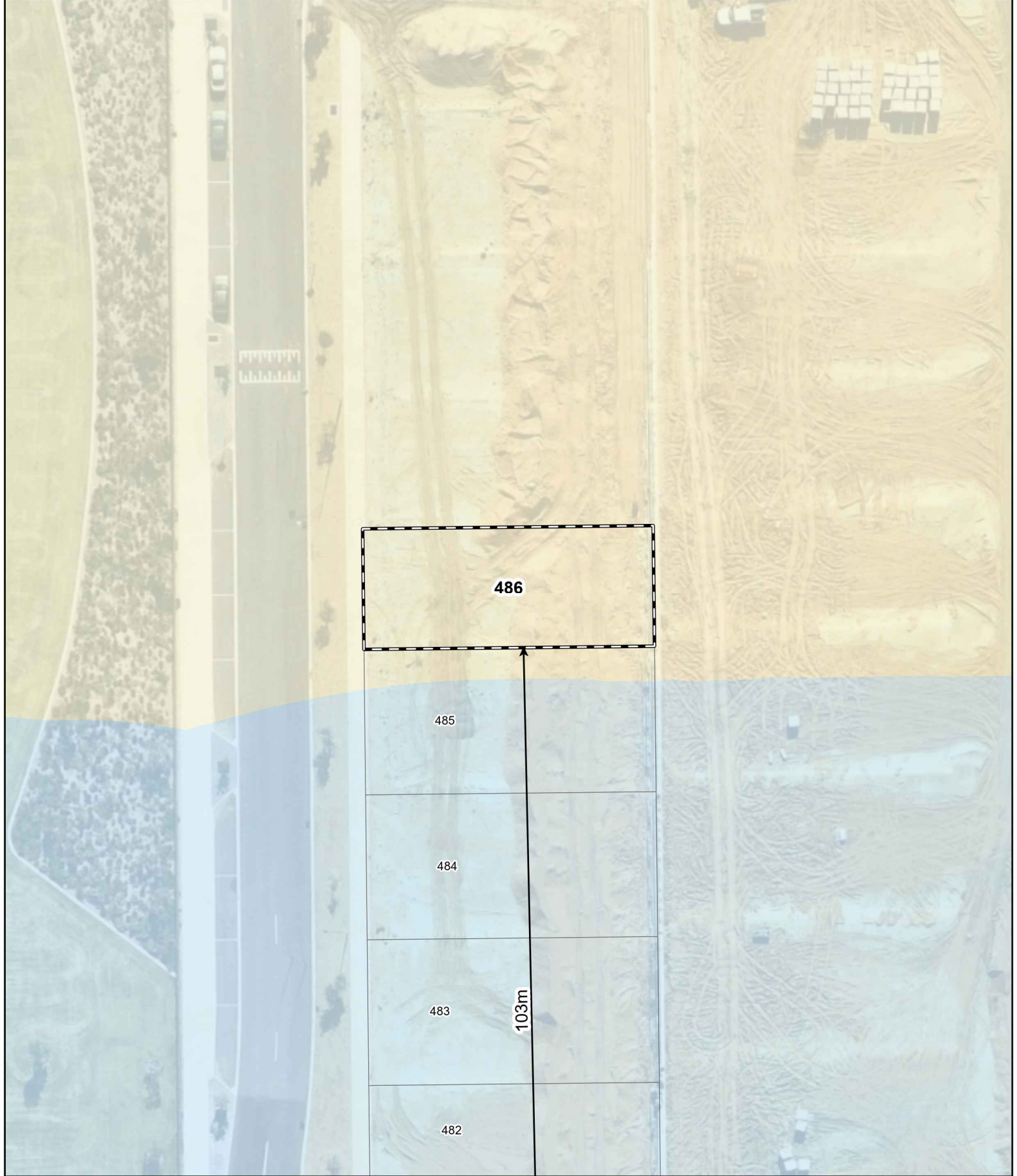
Signature: 

Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

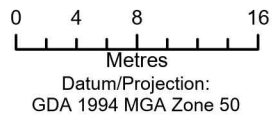
Figure : Bushfire Attack Level (BAL) Contours - Lot 486 (BAL - LOW)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 668, Brightwood Estate		
Suburb:	Baldivis, 6171	State:	WA
Local Government Area:	City of Rockingham		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	17/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class B woodland	Upslope / Flat Land	63 m	BAL - 12.5

Practitioner Details

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 3959-2018.

Name Daniel Panickar
Eco Logical Australia

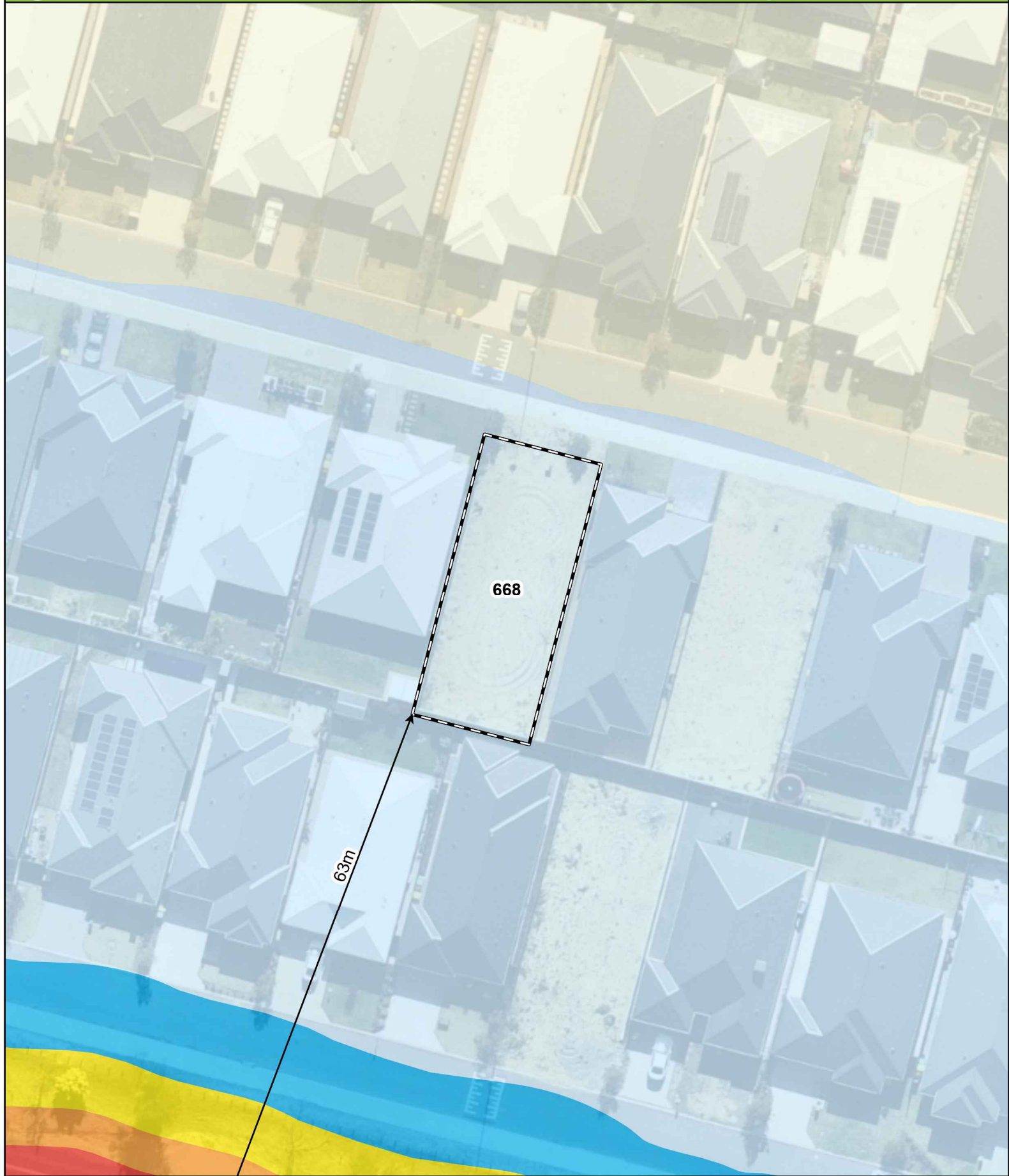
Signature: 

Certificate Date: 17/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 668 (BAL - 12.5)



- Legend**
- 100m site assessment
 - 150m site assessment
 - Lot location
 - Bushfire Hazard Interface
 - Distance to bushfire hazard interface

Bushfire attack level (BAL)

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



0 4 8 16
Metres
Datum/Projection:
GDA 1994 MGA Zone 50



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