

Date 11/06/2020

Our ref: 20PER-16368

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

RE: BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT REPORT FOR LIVING EDGE ESTATE, WELLARD

Site Details

Address: Living Edge Estate - Lots 44, 45, 46, 49, 50, 51, 55, 92, 93, 94, 97 Bromley Road; Lots 40, 41, 42, 43, 60, 61, 62, 64, 65, 66, 67, 68, 71, 73 Glenworth Drive; Lot 6 Ladysmith loop, Lot 154 Monolith Way and Lot 78 Wattleway Road

Suburb: Wellard, 6170 **State:** Western Australia

Local Government Area: City of Kwinana

Description of building works: Future residential development

Report details

Report/Job number: 20PER-16368 **Report version:** v1

Assessment date: 10/06/2020 **Report date:** 11/06/2020

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	1	Classification or Exclusion Clause	Class A forest
Photo Point 1 Classified vegetation within this plot is comprised of Eucalyptus trees between 10 to 30 m tall with approximately 30 to 70% foliage cover. Shrubs, grasses and leaf litter also present. Slope under the vegetation has been assessed as upslope/ flat land.			
Photo Point 2 Classified vegetation within this plot is comprised of Eucalyptus trees between 10 to 30 m tall with approximately 30 to 70% foliage cover. Shrubs, grasses and leaf litter also present. Slope under the vegetation has been assessed as upslope/ flat land.			

Plot	2	Classification or Exclusion Clause	Class B woodland
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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 upslope/ flat land.



Plot	2	Classification or Exclusion Clause	Class B woodland
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Photo Point 4

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 upslope/ flat land.



Plot	3	Classification or Exclusion Clause	Class D scrub
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Photo Point 5

Classified vegetation within this plot is comprised of shrubs >2 m in height and greater than 30% foliage cover.

It is understood the Parcel Property undertake regular maintenance of this area and the current hazard is likely to be removed in the near future.

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



Plot	3	Classification or Exclusion Clause	Class D scrub
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Photo Point 6

Classified vegetation within this plot is comprised of shrubs >2 m in height and greater than 30% foliage cover.

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)
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Photo Point 7

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This is an area of low threat developed land.



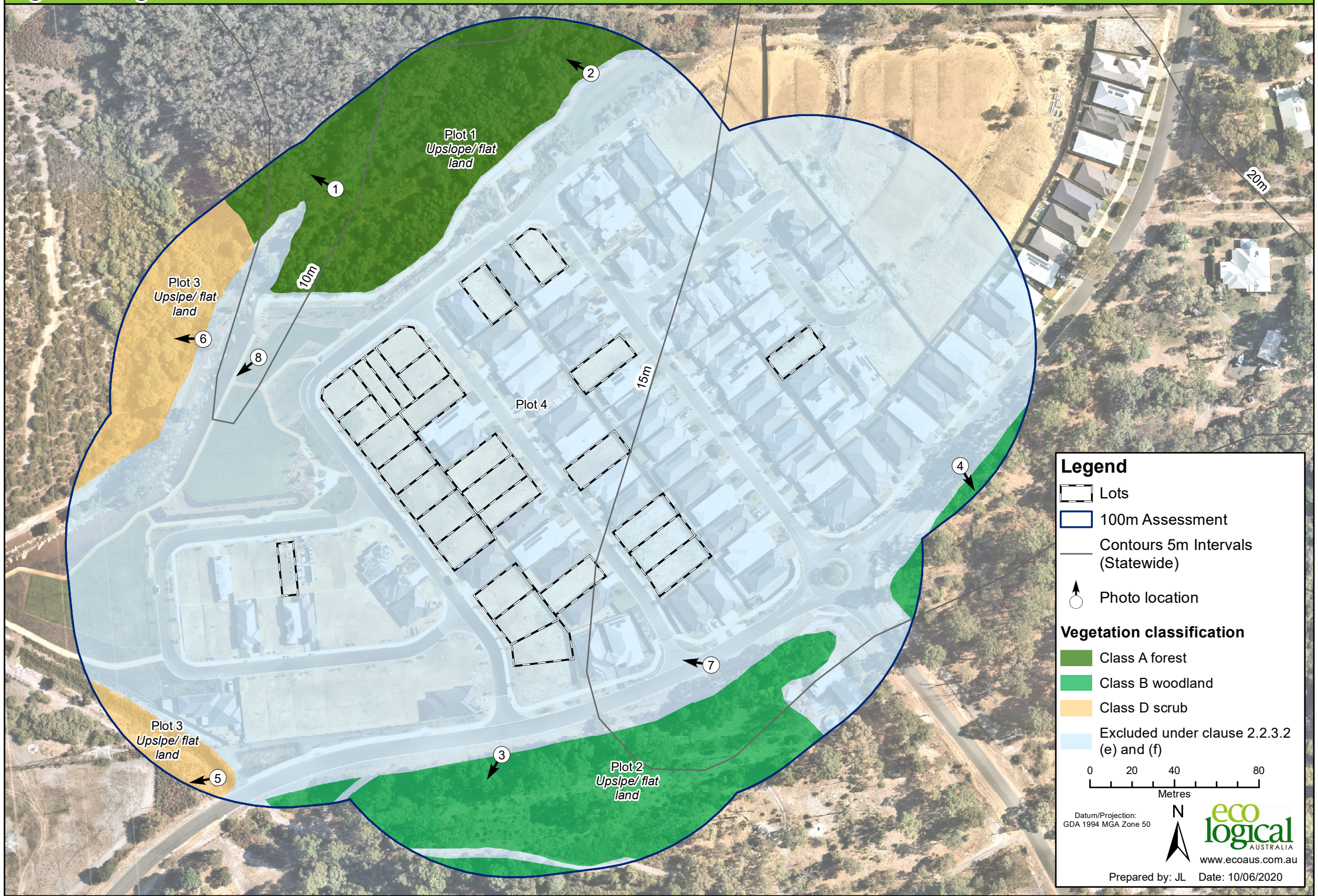
Plot	4	Classification or Exclusion Clause	Excluded under clause 2.2.3.2 (e) and (f)
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Photo Point 8

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This is an area of low threat, maintained vegetation within a drainage swale. The area is mulched.



Figure 1: Vegetation classification



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 A Forest	All upslopes and flat land (0 degrees)	<16	16-<21	21-<31	31-<42	42-<100
2	Class B Woodland	All upslopes and flat land (0 degrees)	<10	10-<14	14-<20	20-<29	29-<100
3	Class D Scrub	All upslopes and flat land (0 degrees)	<10	10-<13	13-<19	19-<27	27-<100
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 relevant data from the site assessment shown in Figure 2 and Table 3.

Table 3: BAL Assessment summary

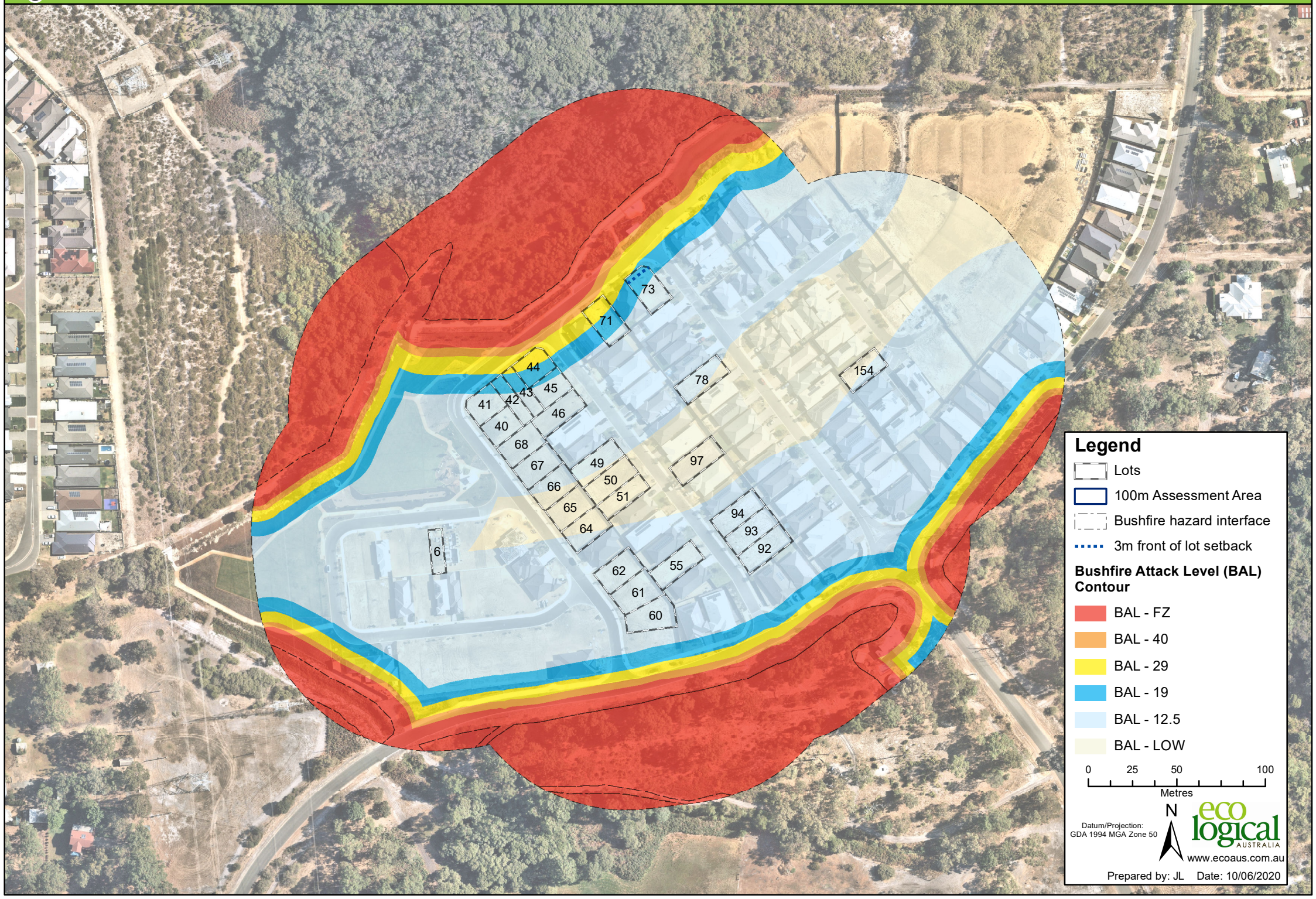
BAL	Affected lots	Construction sections to be consulted in AS 3959-2018
BAL-FZ	Nil	N/A
BAL-40	Nil	N/A
BAL-29	Determined Bushfire Attack Level for: Lots 43*, 44 and 71	3 and 7
BAL-19	Determined Bushfire Attack Level for: Lots 41, 42, 45 and 73 ⁺	3 and 6
BAL-12.5	Determined Bushfire Attack Level for: Lots 6, 40, 46, 49, 55, 60, 61, 62, 64, 66, 67, 68, 78, 92, 93, 94 and 154	3 and 5
BAL-LOW	Determined Bushfire Attack Level for: Lots 50, 51, 65 and 97	4

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

⁺ INDICATES A FRONT OF LOT SETBACK OF 3M HAS REDUCED THE BAL RATING BY ONE LEVEL

This BAL rating is based on the information current at the date of this document and is valid for 12 months. Development in the future may result in a reduced BAL rating for the some of the subject lots.

Figure 2: Bushfire Attack Level Assessment



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 49, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class A forest	Upslope / Flat Land	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

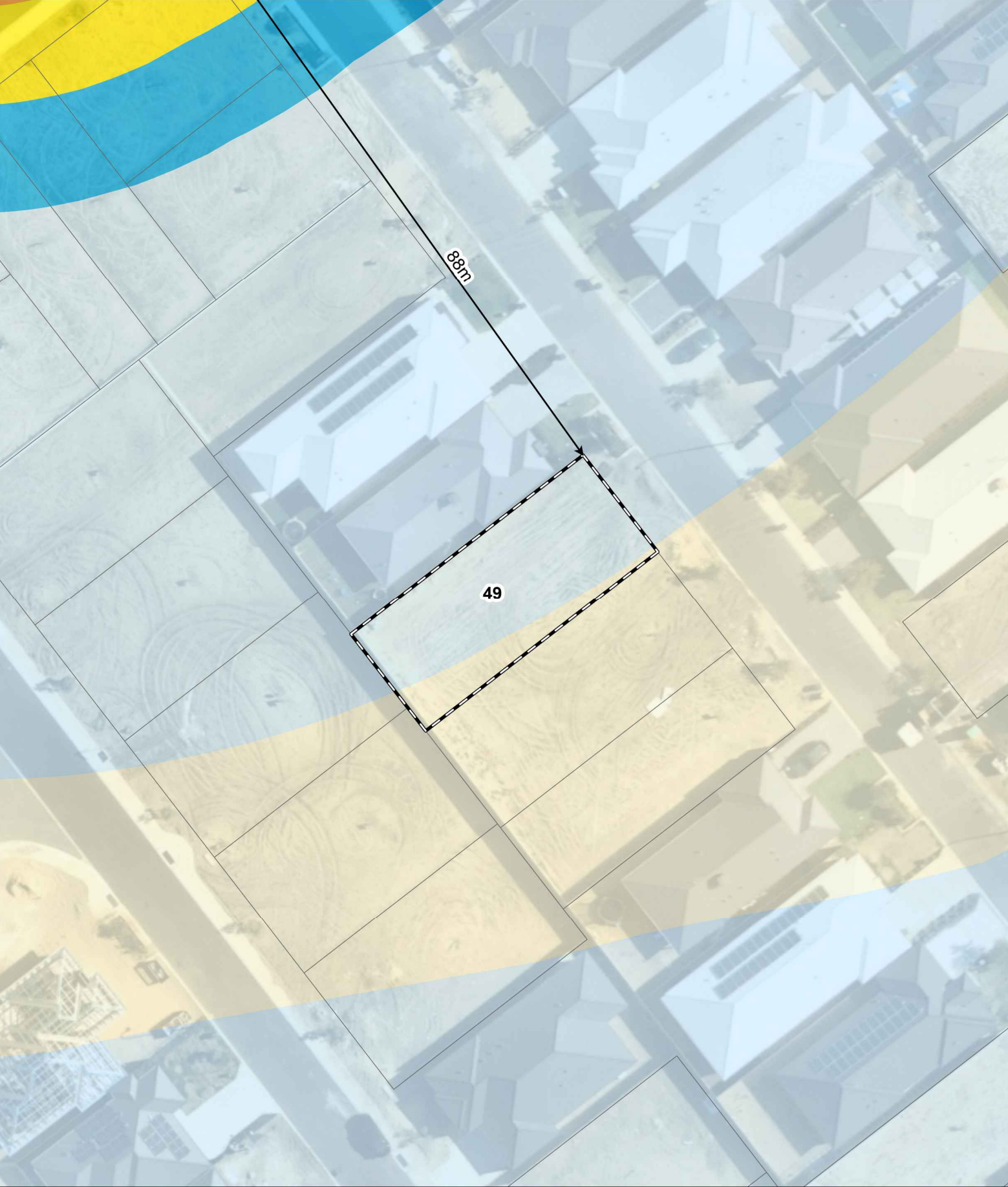
Signature: 

Certificate Date: 11/06/2020



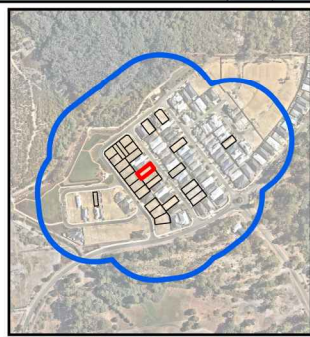
Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 49 (*BAL - 12.5)



- Legend**
- 100m 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



04816

Metres

Datum/Projection:
GDA 1994 MGA Zone 50

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A TETRA TECH COMPANY

Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 50, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

Determination of Highest Bushfire Attack Level

AS 3959 Assessment Procedure	Vegetation Classification	Effective Slope	Separation Distance	BAL
Method 1	Class A forest	Upslope / Flat Land	101 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: 11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 50 (BAL - LOW)

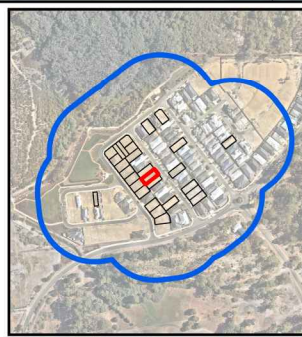


Legend

- 100m 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



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Metres
Datum/Projection:
GDA 1994 MGA Zone 50

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Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 51, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

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	105 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

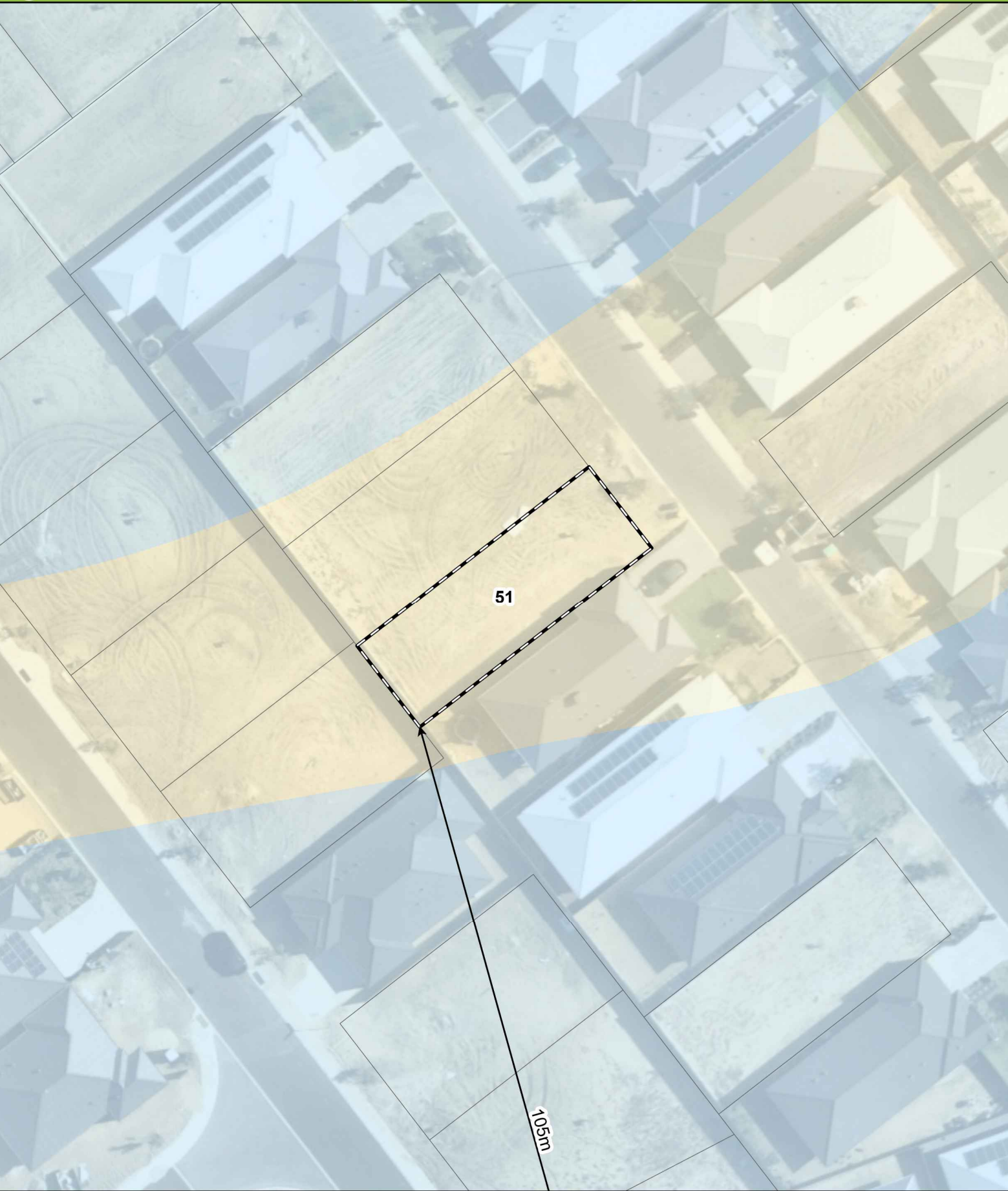
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Certificate Date: 11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 51 (BAL - LOW)



- Legend**
- 100m 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	



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Metres

Datum/Projection:
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Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 55, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

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	60 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

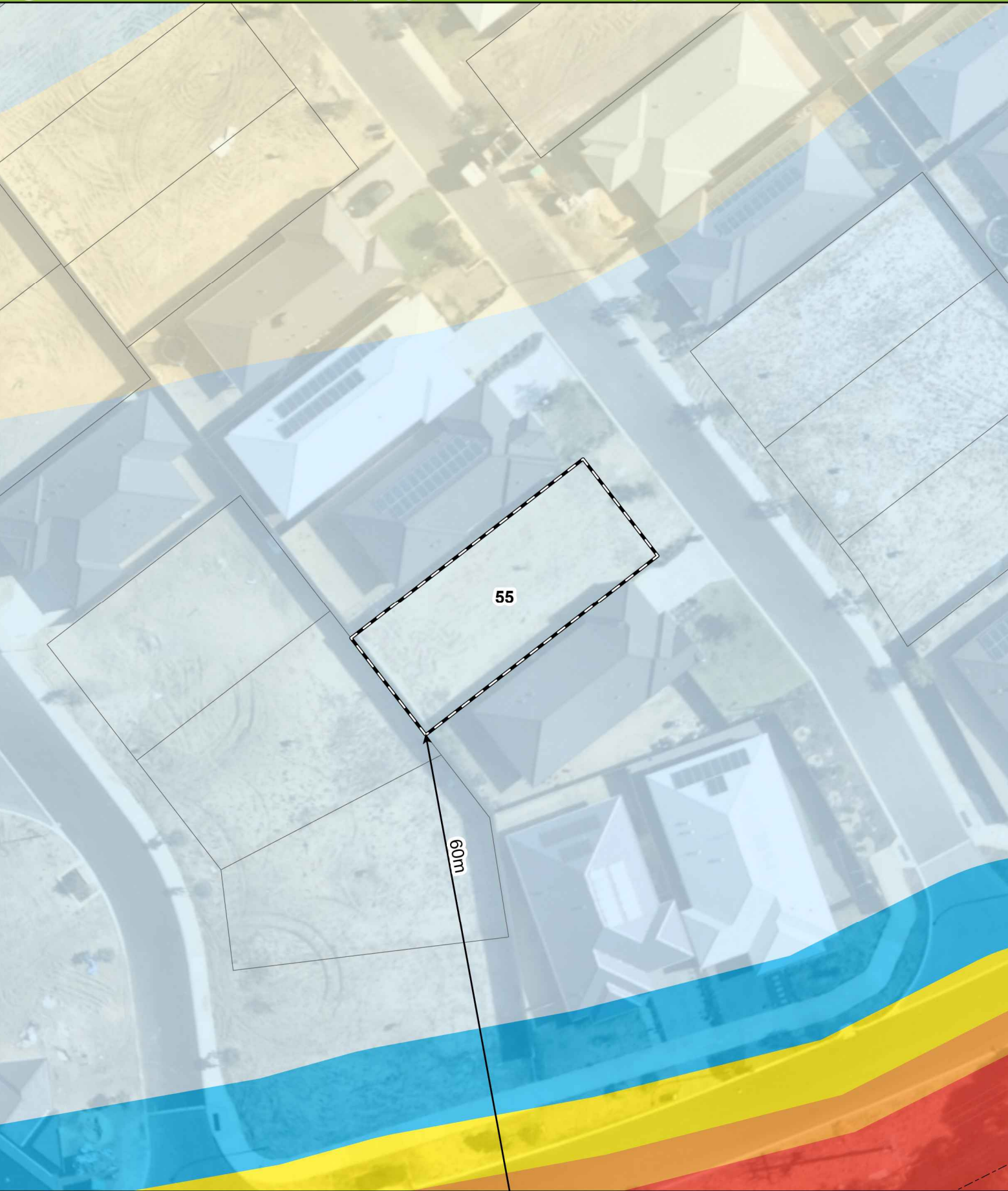
Signature: 

Certificate Date: 11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 55 (BAL - 12.5)



Legend

- 100m 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

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Metres
Datum/Projection:
GDA 1994 MGA Zone 50

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Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 92, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

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	52 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: 11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 92 (BAL - 12.5)



- Legend**
- 100m 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



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Metres

Datum/Projection:
GDA 1994 MGA Zone 50

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Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 93, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

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	65 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

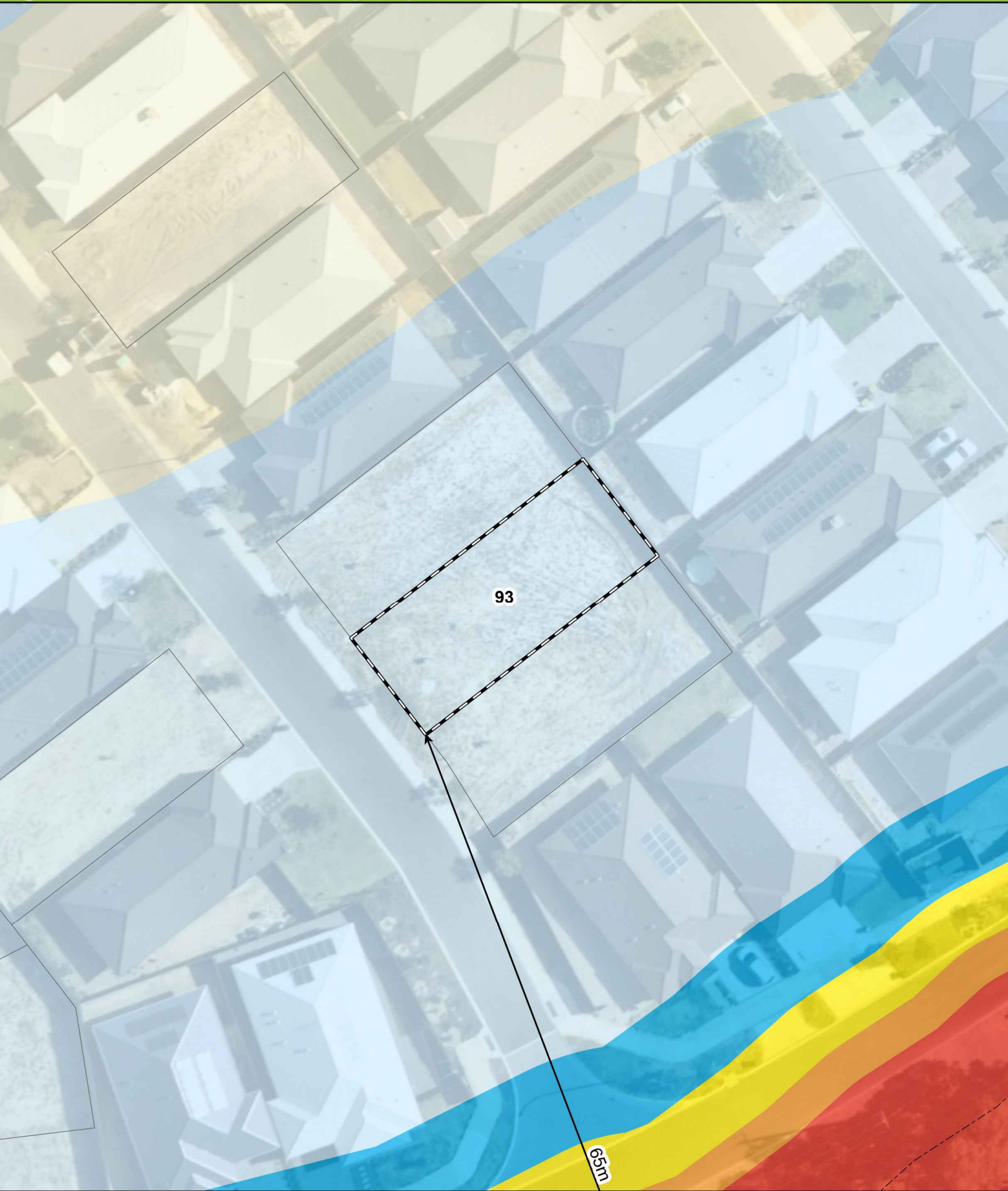
Signature: 

Certificate Date: 11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 93 (BAL - 12.5)



Legend

- 100m 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

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Metres
Datum/Projection:
GDA 1994 MGA Zone 50

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A TETRA TECH COMPANY

Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 94, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

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	77 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

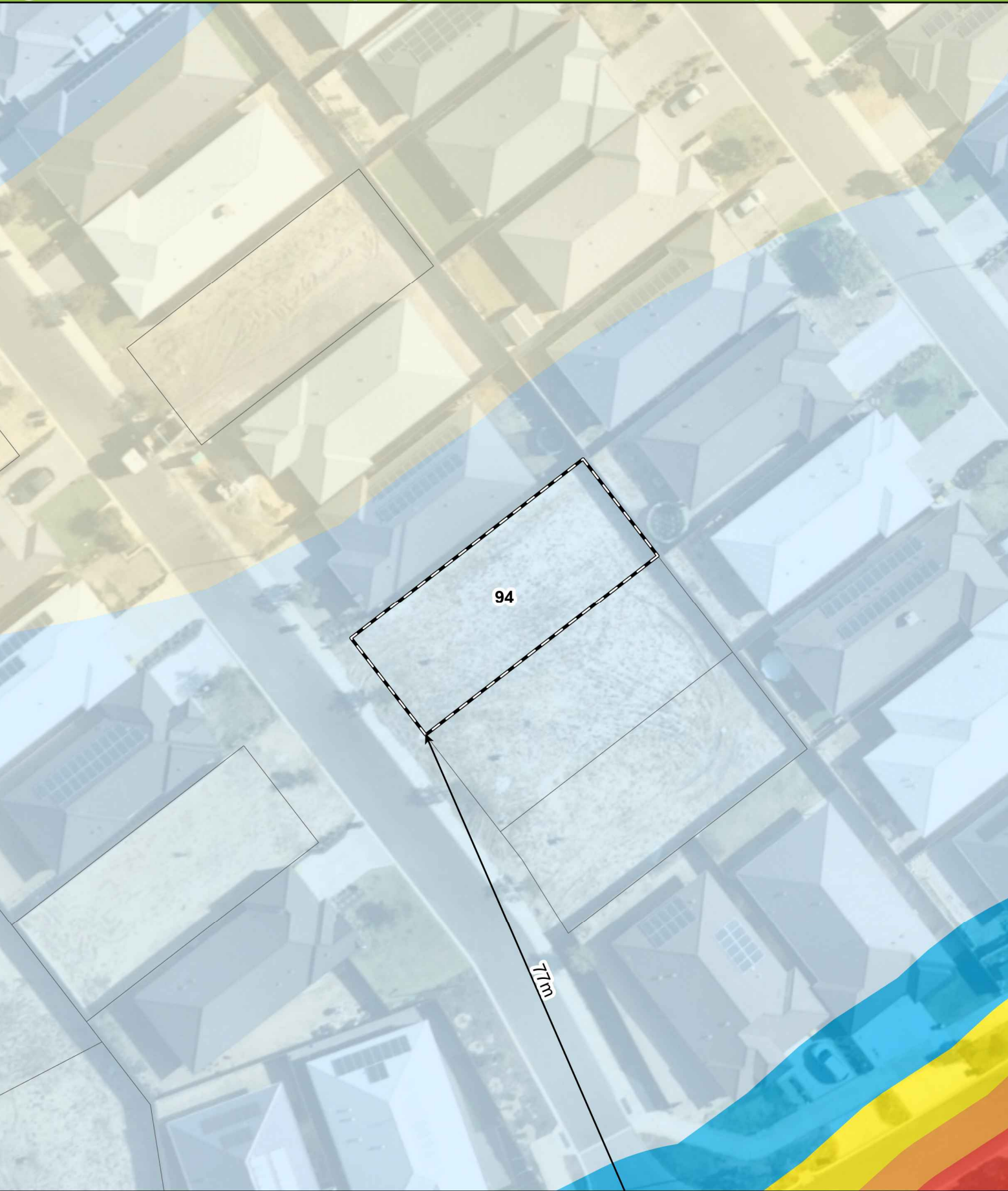
Signature:


Certificate Date:
11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 94 (BAL - 12.5)



Legend

100m 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

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Metres

Datum/Projection:
GDA 1994 MGA Zone 50

A TETRA TECH COMPANY

Prepared by: GM Date: 11/06/2020

Bushfire Attack Level (BAL) Certificate

Determined in accordance with AS 3959-2018

Site Details

Address:	Lot 97, Living Edge Estate		
Suburb:	Wellard, 6170	State:	WA
Local Government Area:	City of Kwinana		
Use of building	Residential Dwelling	Main BCA class:	Class 1a
Report / Job Number:	20PER-16368	Report Date:	11/06/2020

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	113 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

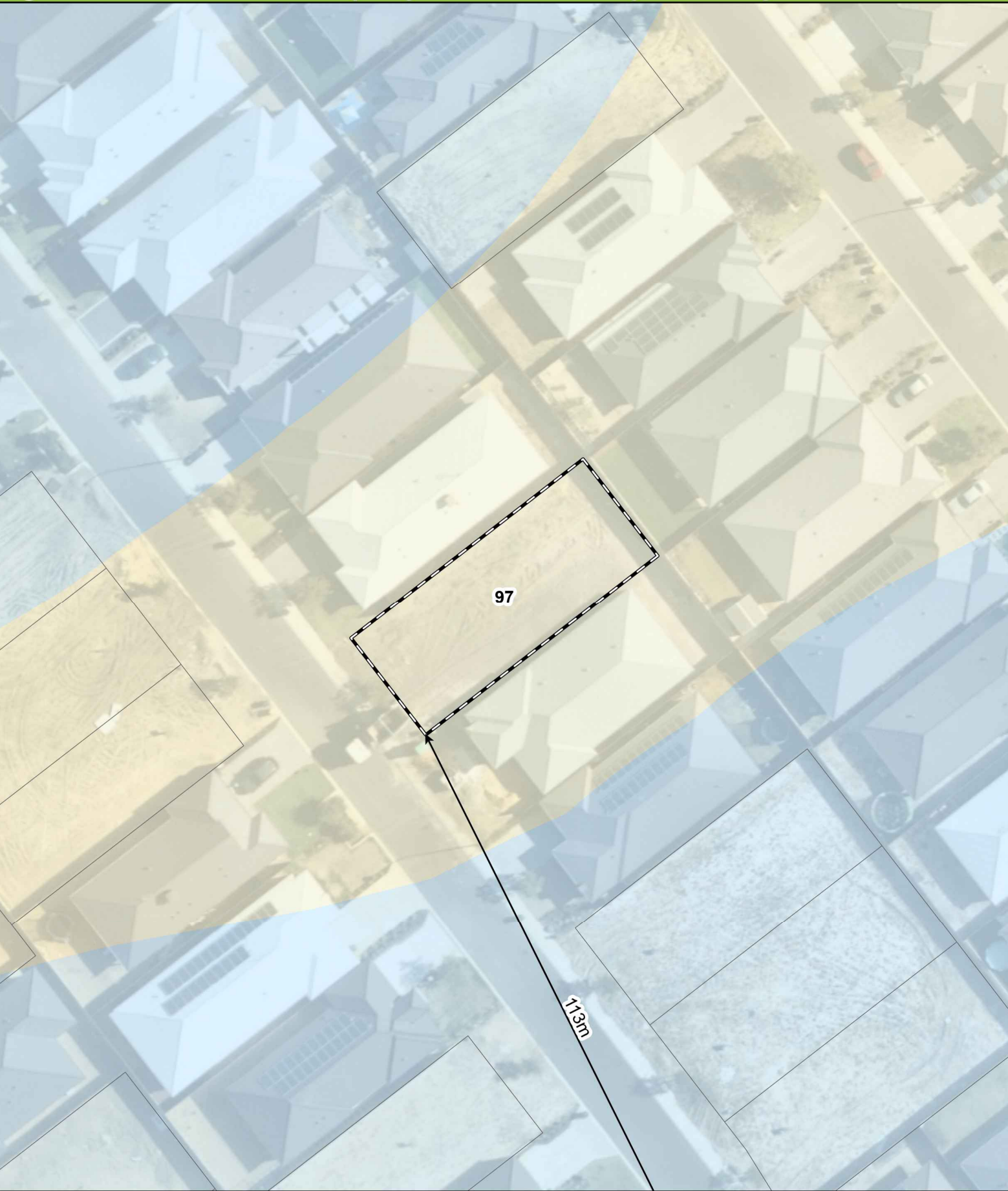
Signature: 

Certificate Date: 11/06/2020



Accreditation No: BPAD 37802
Expiry: December 2020

Figure : Bushfire Attack Level (BAL) Contours - Lot 97 (BAL - LOW)



Legend

- 100m 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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Prepared by: GM Date: 11/06/2020