

Bushfire Attack Level (BAL) Assessment Report for Stage 2A Apsley Estate, Mandogalup

Site Details

Address: Stage 2A Apsley Estate: (Lots 246-251, 256-265, 410-412, 429-433, 453-461)

Suburb: Mandogalup, 6167 **State:** Western Australia

Local Government Area: City of Kwinana

Description of building works: Residential development, future buildings

Report details

Report/Job number:	20PER-16783	Report version:	v1
Assessment date:	5/08/2020	Report date:	25/08/2020
Author:	James Leonard and Daniel Panickar	Review:	Daniel Panickar (BPAD Level 3 – 37802)



SITE ASSESSMENT AND SITE PLAN

The assessment of the 33 subject lots was undertaken on 21 May 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

All vegetation within 100 m of the 33 subject lots was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation class with the potential to determine the BAL is identified below and presented in Figure 1.

It is currently assumed that areas of landscaped vegetation within the site and assessment area will be managed and maintained by QUBE Property Group (the developer) until replaced by residential dwellings and associated infrastructure or handed over to the City of Kwinana in the future.

A 27 m wide APZ has been established and is being maintained by the developer within the Western power easement adjacent to the subject site. The entire Western Power Easement will be cleared and landscaped following the development, approval and implementation of a landscaping plan. The intent

of this landscaping plan is to maintain the entire easement adjacent to the subject site as low threat vegetation.

Plot 1 Classification or Exclusion Clause Class A Forest

Photo Point 1

Classified vegetation within this plot is comprised of trees to 30 m tall with approximately 30 to 70% foliage cover in a wetland setting within a conservation reserve.
Slope under the vegetation has been assessed as upslope/flat land.



Plot 2 Classification or Exclusion Clause Class D Scrub

Photo Point 2

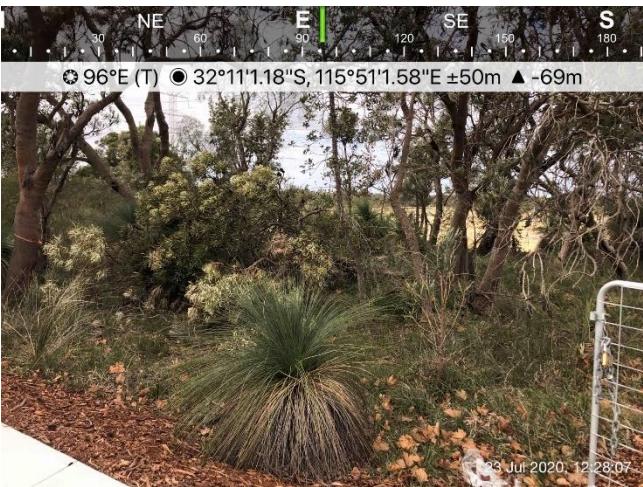
Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure.
Slope under the vegetation has been assessed as downslope >0 to 5 degrees.



Plot 3 Classification or Exclusion Clause Class D Scrub

Photo Point 3

Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure within a conservation reserve.
Slope under the vegetation has been assessed as upslope/flat land.



Plot 3 Classification or Exclusion Clause Class D Scrub

Photo Point 4

Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure within a Western Power easement. Slope under the vegetation has been assessed as upslope/flat land.



Plot 4 Classification or Exclusion Clause Excluded – clause 2.2.3.2 (e) & (f)

Photo Point 5

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This photo depicts land within Apsley Estate that has been recently cleared for development.



Plot 4 Classification or Exclusion Clause Excluded – clause 2.2.3.2 (e) & (f)

Photo Point 6

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This photo depicts land within the Western Power easement east of Apsley Estate that has been recently cleared for an Asset Protection Zone.



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, Table 1 and Figure 2.

Table 1: 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	Upslope / flat land	<16	16-<21	21-<31	31-<42	42-<100
2	Class D Scrub	Downslope >0 to 5°	<11	11-<15	15-<22	22-<31	31-<100
3	Class D Scrub	Upslope / flat land	<10	10-<13	13-<19	19-<27	27-<100
4	Excluded under Clause 2.2.3.2 (e) & (f)	N/A	No separation distances required – BAL-LOW				

DETERMINED BUSHFIRE ATTACK LEVEL (BAL)

The determined Bushfire Attack Level (highest BAL) for the proposed works has been determined in accordance with Clause 2.2.6 of AS 3959-2018 relevant data from the BAL assessment shown in Figure 2 and Table 2.

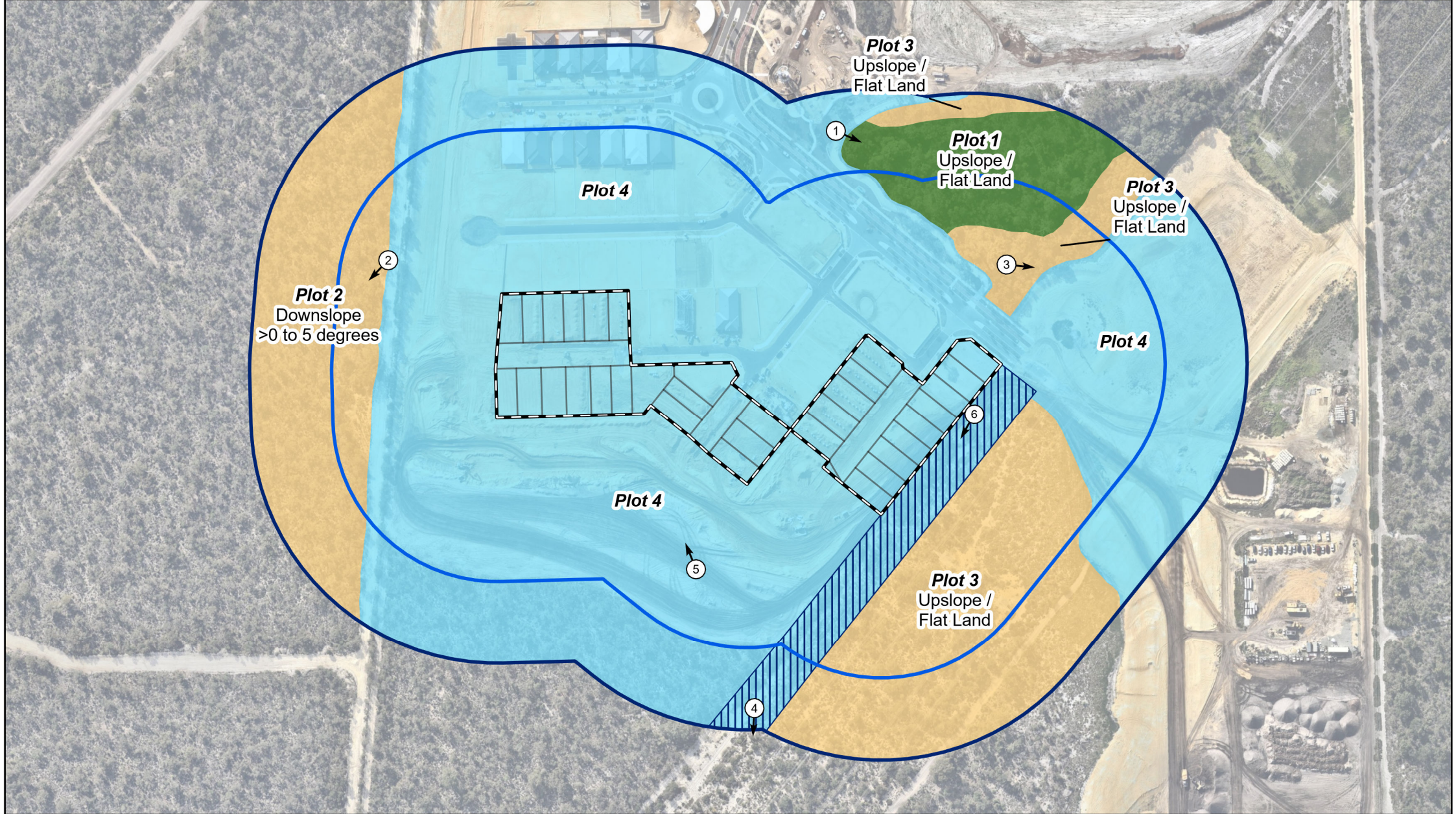
Table 2: BAL Assessment summary

BAL	Affected lots	Construction sections to be consulted in AS 3959-2018
BAL-FZ	Nil	N/A
BAL-40	Nil	N/A
BAL-29	Nil	N/A
BAL-19	Lot 461*.	3 and 6
BAL-12.5	Determined Bushfire Attack Level for: Lots 249, 250, 251, 256, 257, 258*, 429, 430, 431, 432, 433, 453, 454, 455, 456, 457, 458, 459 and 460.	3 and 5
BAL-LOW	Determined Bushfire Attack Level for: Lots 246, 247, 248, 259, 260, 261, 262, 263, 264, 265, 410, 411 and 412.	3 and 4

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

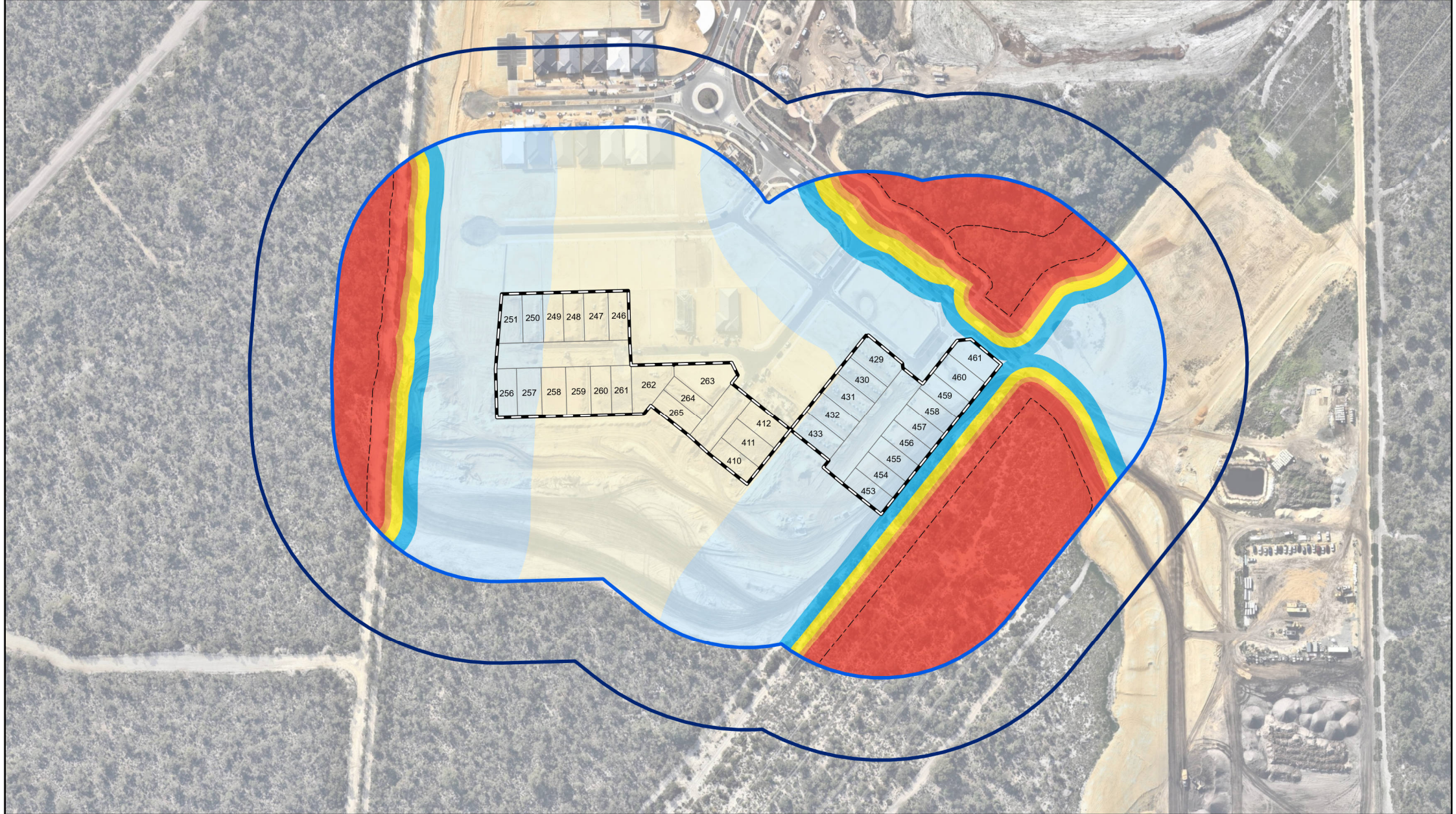
This BAL rating is based on the information current at the date of this document and is valid for 12 months.

Figure 1: Vegetation Classification



Legend		Vegetation classification	<p>0 25 50 100 Metres</p> <p>Datum/Projection: GDA 1994 MGA Zone 50</p> <p>N eco logical AUSTRALIA A TETRA TECH COMPANY</p> <p>Prepared by: GM Date: 20/08/2020</p>
<p> Subject site</p> <p> Proposed Lot Boundary</p> <p> 100m site assessment</p>	<p> 150m site assessment</p> <p> Scheduled clearing for APZ</p>		

Figure 2: Bushfire Attack Level (BAL) Contours



Legend			
Subject site	Bushfire Hazard Interface	Bushfire Attack Level (BAL)	
100m site assessment	Lot Boundaries	BAL - FZ	
150m site assessment		BAL - 40	
		BAL - 29	
		BAL - 19	
		BAL - 12.5	
		BAL - LOW	

0 25 50 100
Metres

Datum/Projection:
GDA 1994 MGA Zone 50

N

eco
logical
AUSTRALIA
A TETRA TECH COMPANY

Prepared by: GM Date: 25/08/2020

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) Assessment Report for Stage 2B Apsley Estate, Mandogalup

Site Details

Address: Stage 2B Apsley Estate: (Lots 266-269, 284-286, 403-409, 434-444, 447-452 and 841)

Suburb: Mandogalup, 6167 **State:** Western Australia

Local Government Area: City of Kwinana

Description of building works: Residential development, future buildings

Report details

Report/Job number:	20PER-16783	Report version:	v1
Assessment date:	1/10/2020	Report date:	16/12/2020
Author:	James Leonard and Daniel Panickar	Review:	Daniel Panickar (BPAD Level 3 – 37802)



SITE ASSESSMENT AND SITE PLAN

The assessment of the 32 subject lots was undertaken on 23 July 2020 with follow-up assessments undertaken on 5 August 2020 and 1 October 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

All vegetation within 100 m of the 32 subject lots was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation class with the potential to determine the BAL is identified below and presented in Figure 1.

It is currently assumed that areas of landscaped vegetation within the site and assessment area will be managed and maintained by QUBE Property Group (the developer) until replaced by residential dwellings and associated infrastructure or handed over to the City of Kwinana in the future.

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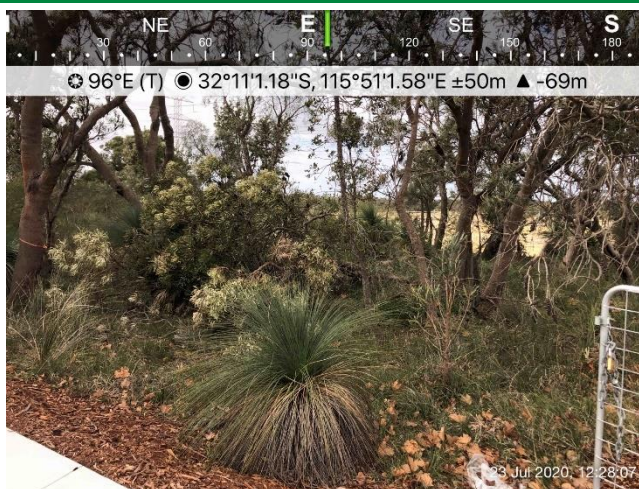
of this landscaping plan is to maintain the entire easement adjacent to the subject site as low threat vegetation.

Plot 1 Classification or Exclusion Clause Class D Scrub

Photo Point 1

Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure within a conservation reserve.

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



Plot 1 Classification or Exclusion Clause Class D Scrub

Photo Point 2

Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure within a Western Power easement.

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Plot 1 Classification or Exclusion Clause Class D Scrub

Photo Point 3

Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure.

Slope under the vegetation has been assessed as downslope >0 to 5 degrees.

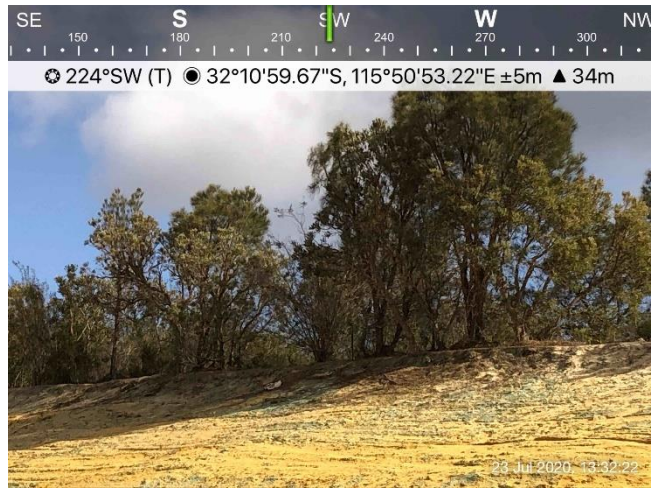


Plot 2 Classification or Exclusion Clause Class D Scrub

Photo Point 4

Classified vegetation within this plot is comprised of shrubs >2 m high with greater than 30% foliage cover. Vegetation represents banksia woodlands in a scrub structure.

Slope under the vegetation has been assessed as downslope >0 to 5 degrees.



Plot 3 Classification or Exclusion Clause Excluded – clause 2.2.3.2 (e) & (f)

Photo Point 5

This plot has been excluded under Clause 2.2.3.2 (e) & (f) of AS 3959-2018. This photo depicts land within Apsley Estate that has been recently cleared for development.



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1	Class D Scrub	Upslope / flat land	<10	10-<13	13-<19	19-<27	27-<100
2	Class D Scrub	Downslope >0 to 5°	<11	11-<15	15-<22	22-<31	31-<100
3	Excluded under Clause 2.2.3.2 (e) & (f)	N/A	No separation distances required – BAL-LOW				

DETERMINED BUSHFIRE ATTACK LEVEL (BAL)

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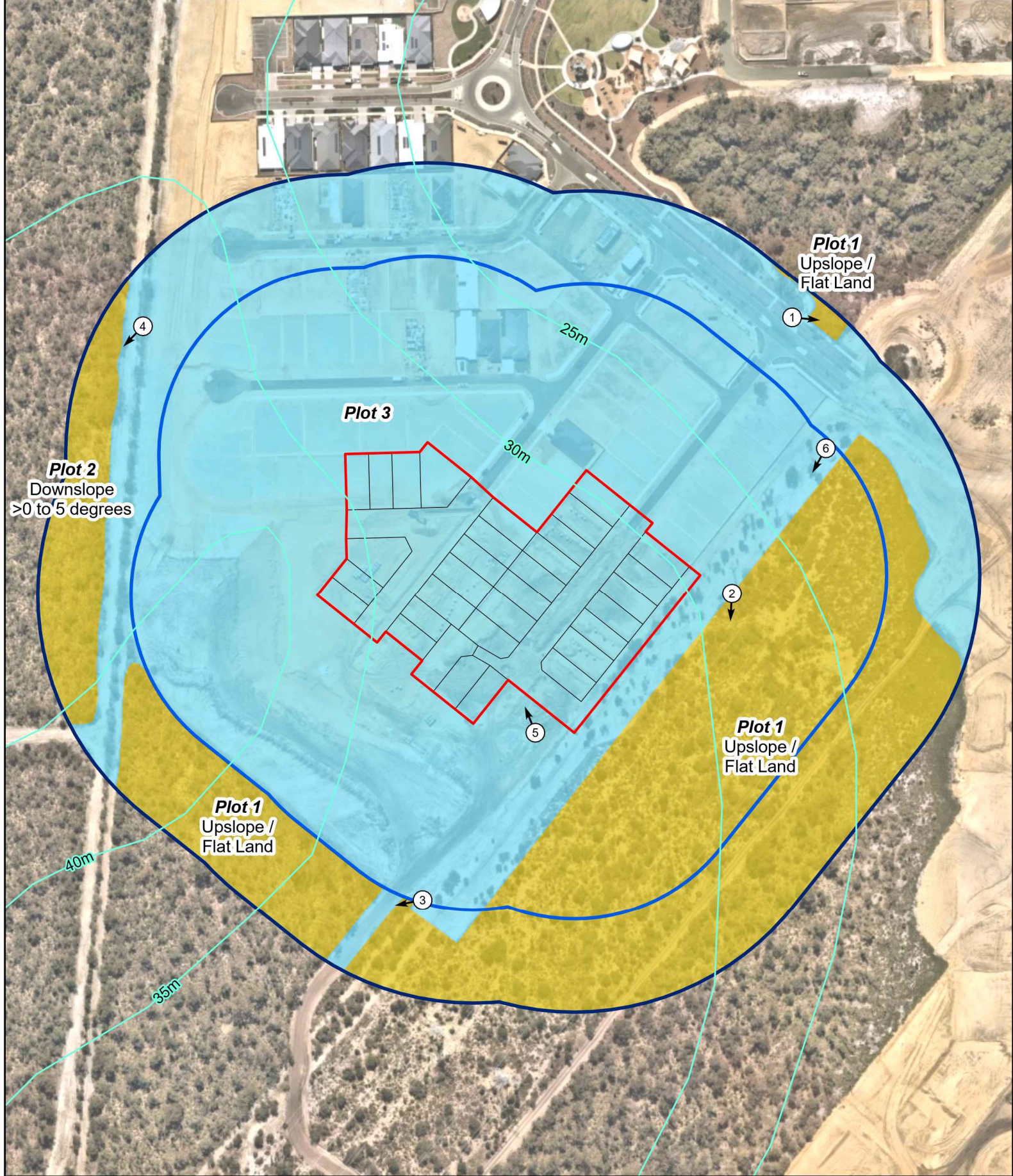
Table 2: BAL Assessment summary

BAL	Affected lots	Construction sections to be consulted in AS 3959-2018
BAL-FZ	Nil	N/A
BAL-40	Nil	N/A
BAL-29	Nil	N/A
BAL-19	Nil	3 and 6
BAL-12.5	Determined Bushfire Attack Level for: Lots 434*, 435*, 436*, 437*, 438*, 439*, 440*, 441*, 442*, 443, 444, 447, 448, 449, 450, 451, 452 and 841.	3 and 5
BAL-LOW	Determined Bushfire Attack Level for: Lots 266, 267, 268, 269, 284, 285, 286, 403, 404, 405, 406, 407, 408 and 409.	3 and 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 1: Vegetation Classification - Stage 2B



- Legend**
- Subject site
 - 100m site assessment
 - 150m site assessment
 - Lot boundary

Photo location

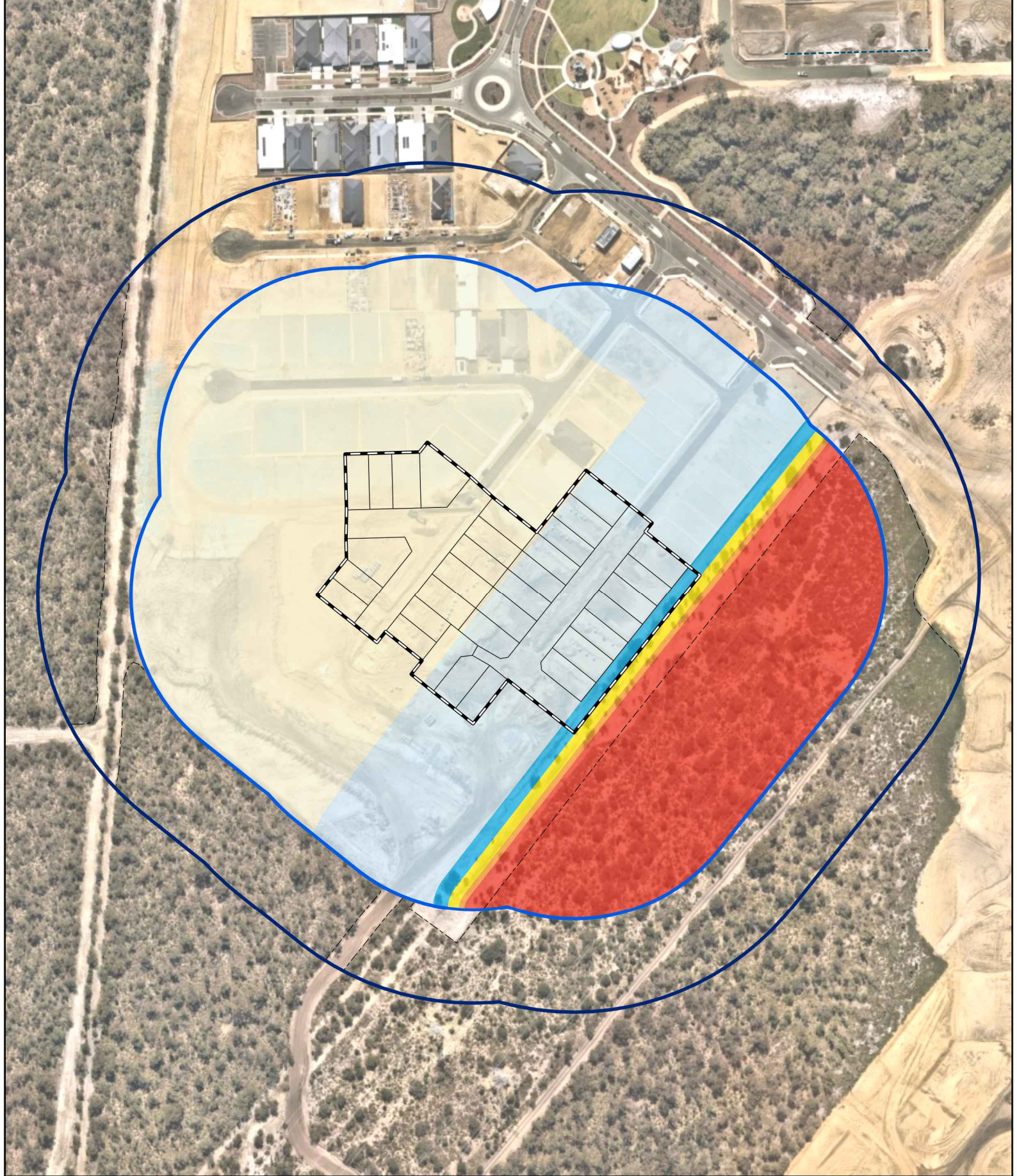
Contour (5m)

Vegetation classification

- Class D scrub
- Excluded as per clause 2.2.3.2 (e) and (f)

0 20 40 80
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

Figure 3: Bushfire Attack Level (BAL) Contours - Stage 2B



- Legend**
- Subject site
 - 100m site assessment
 - 150m site assessment
 - Lot boundary
 - Lot Setback (3m)
 - Bushfire Hazard Interface

Bushfire Attack Level (BAL)

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

0 20 40 80
Metres
Datum/Projection:
GDA 1994 MGA Zone 50

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BAL-19	>12.5 kW/m ² ≤19 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 kW/m ² ≤29 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 kW/m ² ≤40 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 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