

## Bushfire Attack Level (BAL) Assessment Report

Site details

Address:

Lots 1, 2, 3 & Precinct 16, Ninth Road/Stage 3 Claravale Estate

Suburb:

Hilbert

State:

Western Australia

Local Government Area:

City of Armadale

Description of Building Works:

Subdivision of 43 lots

Report details

Project number	A23.097	Report version	0
Assessment date	31/05/2024	Report date	4/06/2024
Author	Bridie Farrar Bushfire Consultant	Review	Daniel Panickar BPAD L3-37802 <div><div><div></div><div>BPAD</div><div>Bushfire Planning &amp; Design</div><div>Accredited Practitioner Level 3</div></div></div>

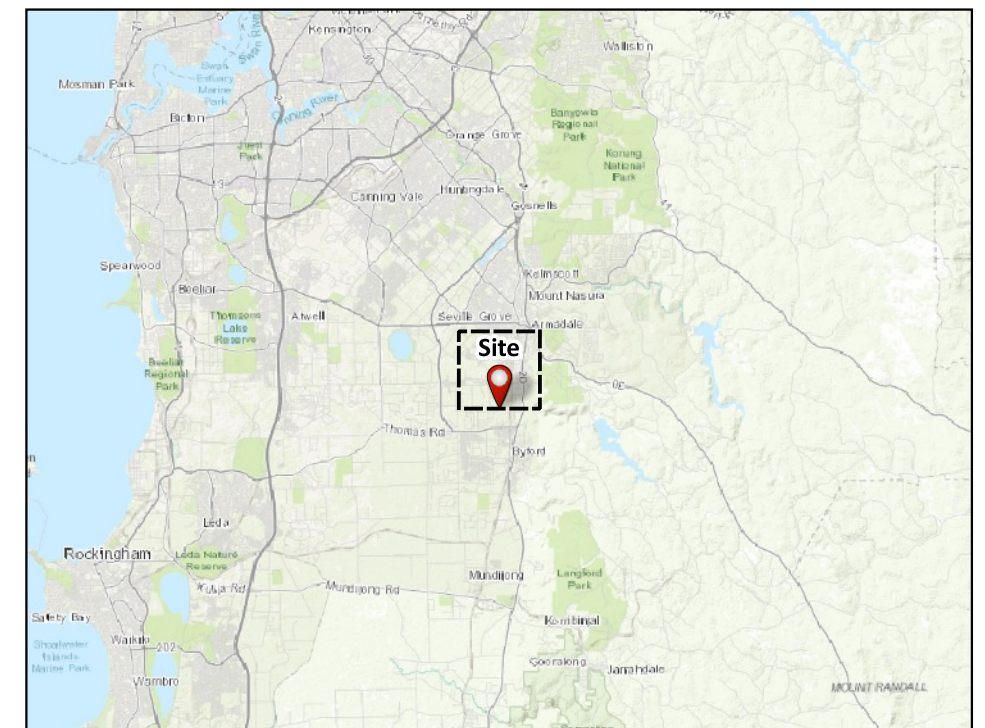
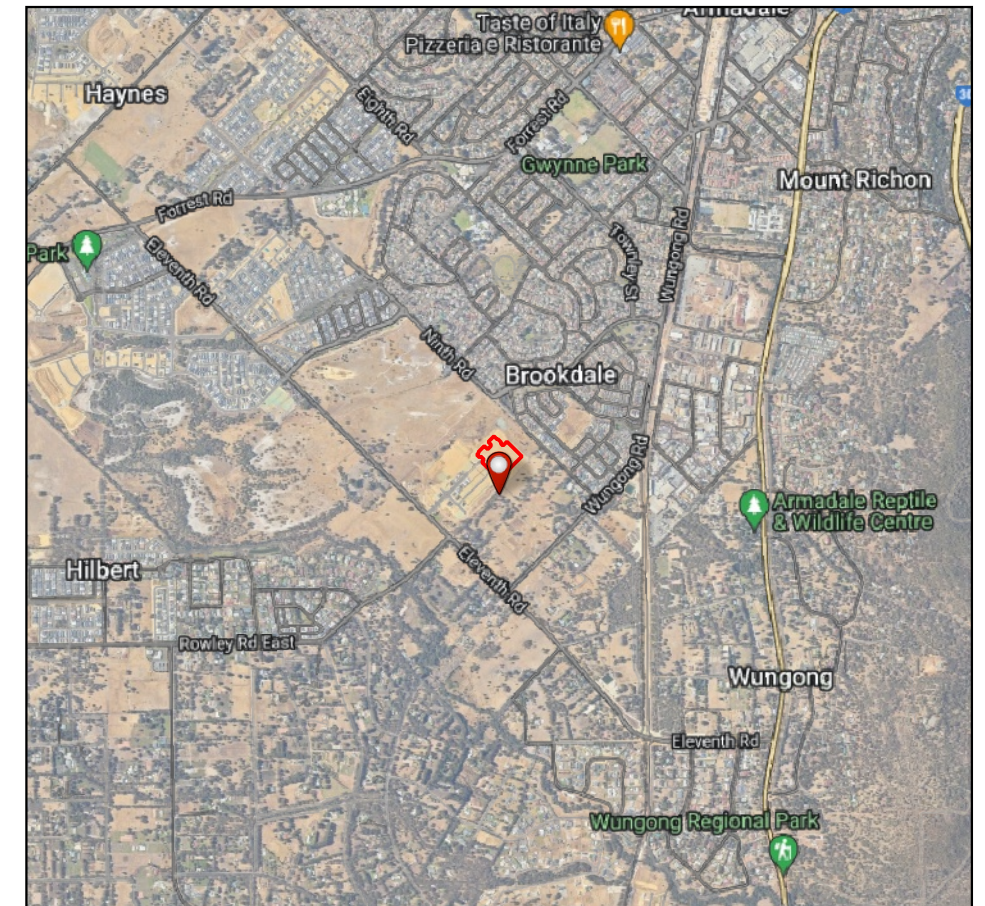
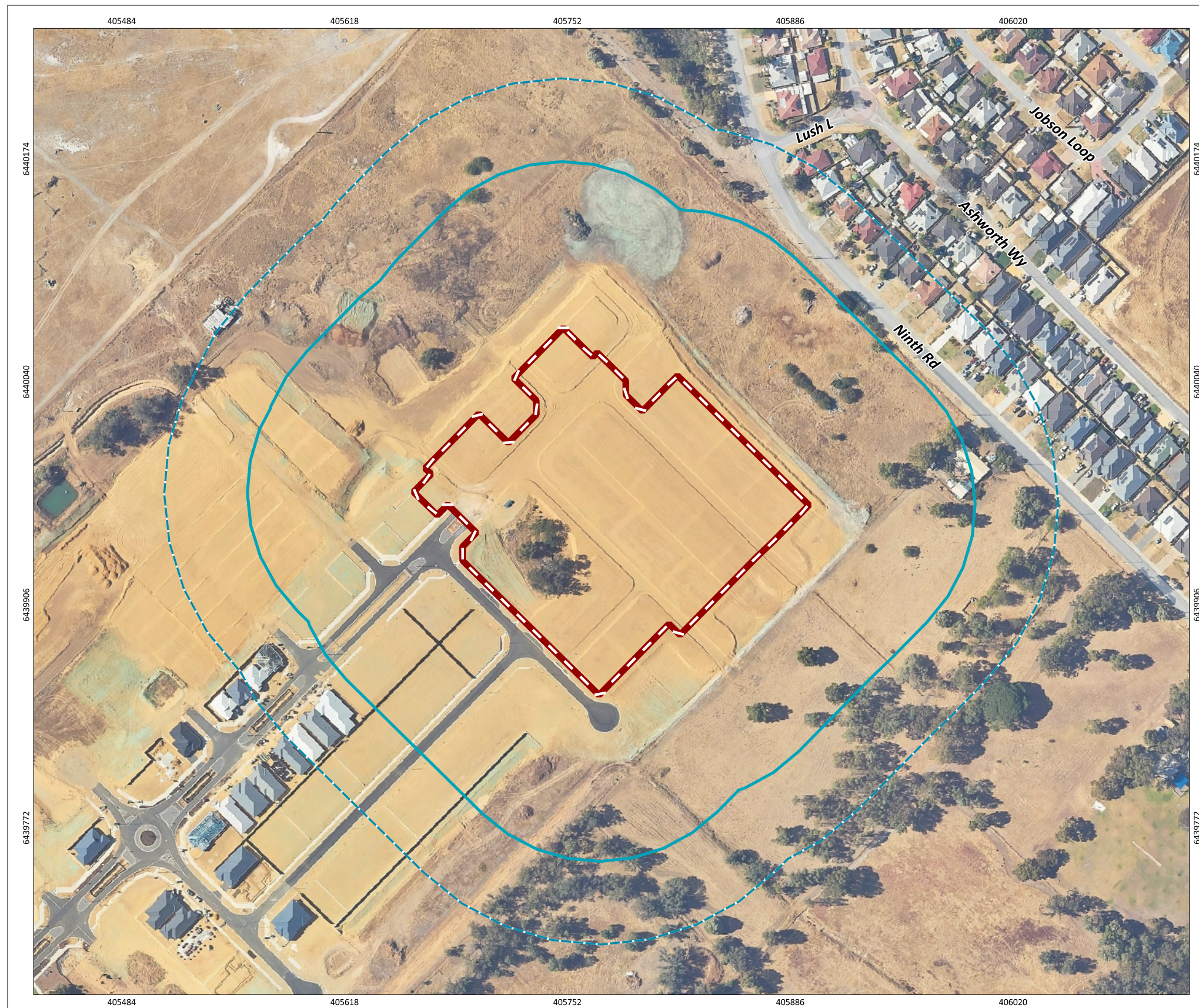
### Site Assessment and Site Plan

The assessment of the 43 lots was undertaken on 31/05/2024 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* (AS 3959: 2018; SA 2018) Simplified Procedure (Method 1). An overview of the site is presented in Figure 1.

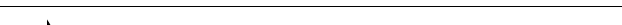
### Vegetation Classification

All vegetation within 100 m of Stage 3 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 in Table 1 and presented in Figure 2.








### Figure 1: Site Overview

		PROJECT/REPORT NAME BAL Report Stage 3 Claravale	
SCALE 1:2,673		CLIENT Parcel property	
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		PROJECT NUMBER A23.097	
DATA SOURCE LANDGATE AERIAL IMAGERY Summer 2023		VERSION 0	
		DRAWN BY / REVIEWED BY SM/BF	
		DATE 4/6/2024	


**Legend**

-  Subject Site
-  Buffer 100m
-  Buffer 150m

No	Description	Drawn	Approved	Date
A	Original issue	SM	BF	4/6/2024

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).



**WESTERN**  
ENVIRONMENTAL




Western Environmental Pty Ltd  
08 6244 2310 | enquiries@westernenv.com.au  
Level 3/25 Prowse St, West Perth WA 6005  
westernenv.com.au






**Table 1: Vegetation Classification**

Plot 1	Class G Grassland
<p><b>Photo 1</b></p> <p>Trees up to 30 m in height with a dominant grassy understorey. The overall canopy cover in this plot is less than 10%.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	
Plot 1	Class G Grassland
<p><b>Photo 2</b></p> <p>Trees up to 30 m in height with a dominant grassy understorey. The overall canopy cover in this plot is less than 10%.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	
Plot 1	Class G Grassland
<p><b>Photo 3</b></p> <p>Trees up to 30 m in height with a dominant grassy understorey. The overall canopy cover in this plot is less than 10%.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	




Plot 1	Class G Grassland
<p><b>Photo 4</b></p> <p>Trees up to 30 m in height with isolated canopies and a dominant grassy understorey. The overall cover of trees is less than 30% and fire behaviour is expected to be driven predominantly by the understorey fuels.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	 <p>May 31, 2024 11:18:52 AM  -32°10'22.49071"S 116°0'7.37741"E ±3.62m  305° NW</p>
Plot 1	Class G Grassland
<p><b>Photo 5</b></p> <p>Trees up to 30 m in height with isolated canopies and a dominant grassy understorey. The overall cover of trees is less than 30% and fire behaviour is expected to be driven predominantly by the understorey fuels.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	 <p>May 3, 2024 9:32:03 AM  -32°10'22.00675"S 116°0'12.68856"E ±3.83m  281° W</p>
Plot 1	Class G Grassland
<p><b>Photo 6</b></p> <p>Trees up to 30 m in height with isolated canopies and a dominant grassy understorey. The overall cover of trees is less than 30% and fire behaviour is expected to be driven predominantly by the understorey fuels.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	 <p>May 31, 2024 11:19:19 AM  -32°10'25.66494"S 116°0'4.79487"E ±3.62m  254° W</p>



<b>Plot 1</b>	<b>Class G Grassland</b>
<p><b>Photo 7</b></p> <p>Trees up to 30 m in height with isolated canopies and a dominant grassy understorey. The overall cover of trees is less than 30% and fire behaviour is expected to be driven predominantly by the understorey fuels.</p> <p>The slope under this vegetation was assessed to be upslope/flat land.</p>	
<b>Plot 2</b>	<b>Class G Grassland</b>
<p><b>Photo 8</b></p> <p>Roads and lots which are devoid of vegetation in an adjacent stage of the subdivision.</p>	
<b>Plot 2</b>	<b>Class G Grassland</b>
<p><b>Photo 9</b></p> <p>The designated Public Open Space within Stage 3 which has been maintained to a low-threat state.</p>	





Plot 2	Class G Grassland
<p><b>Photo 10</b></p> <p>Areas adjacent to the subject site which are devoid of vegetation.</p>	<p>May 3, 2024 9:00:19 AM -32°10'25.37549"S 116°0'4.63558"E ±3.59m 281° W</p> 
Plot 2	Class G Grassland
<p><b>Photo 11</b></p> <p>Cleared areas and areas of low-threat vegetation in the form of maintained grass surrounding the subject site.</p>	<p>May 31, 2024 11:18:56 AM -32°10'22.97614"S 116°0'7.27645"E ±3.62m 291° W</p> 
Plot 2	Class G Grassland
<p><b>Photo 12</b></p> <p>Roads, residential dwellings and associated low-threat gardens in the areas to the north of the subject site.</p>	<p>May 3, 2024 9:30:00 AM -32°10'15.89159"S 116°0'5.75262"E ±2.63m 100° E</p> 





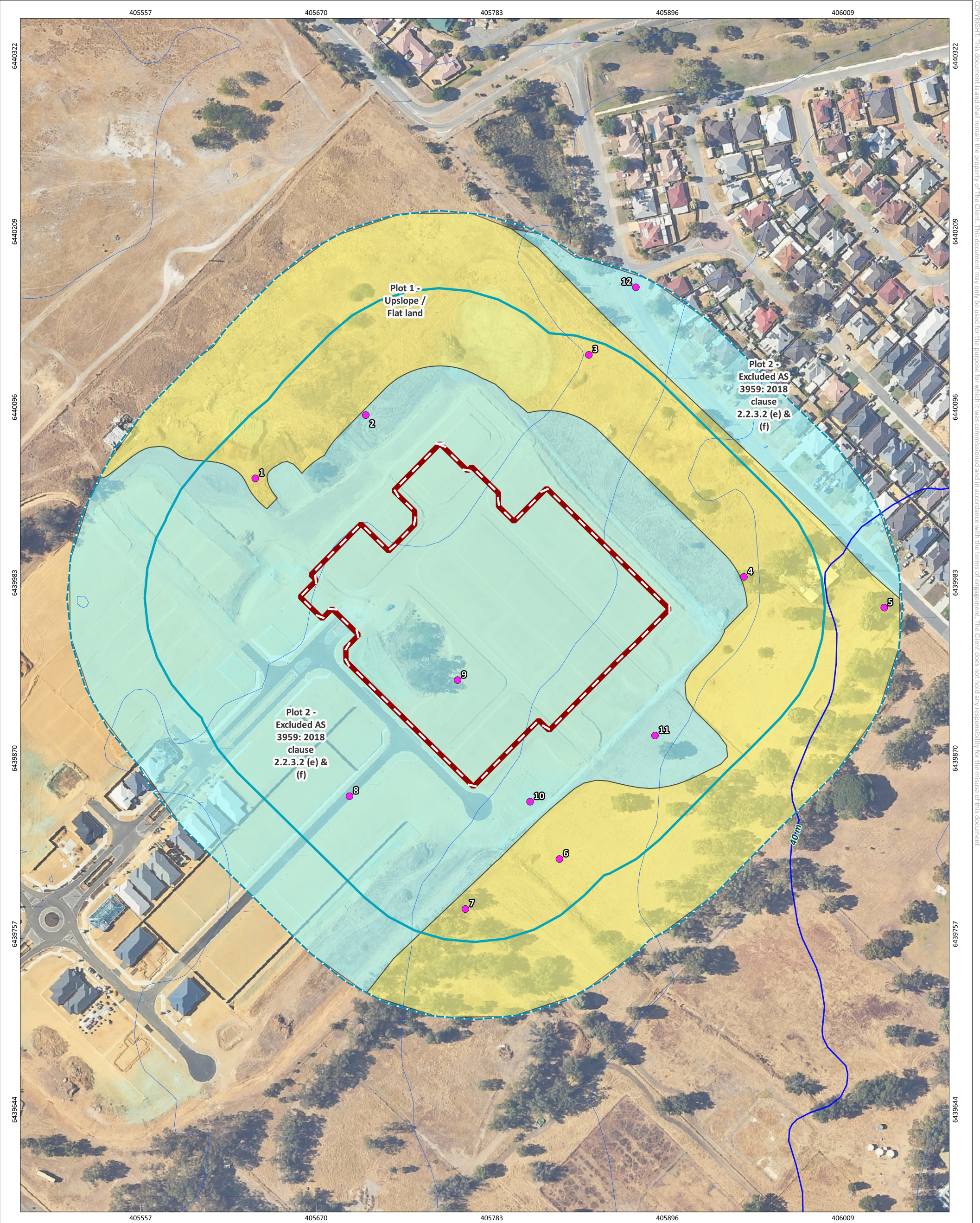


Figure 2: Vegetation Classification

0

20

40

60

80 m

N

SCALE

1:2,256

SHEET SIZE

A3 COLOUR

PROJECT/REPORT NAME

BAL Report  
Stage 3 Claravale

CLIENT

Parcel property

PROJECT NUMBER

A23.097

VERSION

0

DRAWN BY / REVIEWED BY

SM/BF

DATE

4/6/2024

Legend

Subject Site

Buffer 100m

Buffer 150m

2m Contours (DPIRD-072)

10m

2m

Photos

Vegetation Classification

Class G - Grassland

Excluded AS 3959: 2018 2.2.3.2

No	Description	Drawn	Approved	Date
A	Original Issue	SM	BF	4/6/2024

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

WESTERN  
ENVIRONMENTAL

Western Environmental Pty Ltd

08 6244 2310 | enquiries@western.com.au

Level 3/25 Prowse St, West Perth WA 6005

western.com.au

G:\GIS\Project Data\A23.097\Stage3\_BAL\A23.097\_Stage3.qgz

COPYRIGHT: This document is and shall remain the property of The Client. This document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement. The Client does not hold any responsibility for the misuse of this document

Designed and Automated by AC



### Relevant Fire Danger Index

The Fire Danger Index for this site has been determined in accordance with Table 2.1 of AS 3959: 2018 and is presented in Table 2.

**Table 2: Fire Danger Index (FDI)**

Relevant Fire Danger Index			
FDI 40 <input type="checkbox"/> <i>Table 2.4.5</i>	FDI 50 <input type="checkbox"/> <i>Table 2.4.4</i>	FDI 80 <input checked="" type="checkbox"/> <i>Table 2.4.3</i>	FDI 100 <input type="checkbox"/> <i>Table 2.4.2</i>

### Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below in Table 3.

**Table 3: Method 1 BAL Calculation (BAL Contours)**

Plot	Vegetation classification	Effective slope	Separation distances required (m)				
			BAL-FZ	BAL-40	BAL-29	BAL-19	BAL-12.5
1	Class G Grassland	All upslopes and flat land (0 degrees)	<6	6 - <8	8 - <12	12 - <17	17 - <50
2	Excluded - clause 2.2.3.2 (e) & (f)	-	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 site assessment shown in Figure 3 and Table 4.

**Table 4: BAL Assessment Summary**

Affected lot	BAL Rating	Construction sections to be consulted in AS 3959: 2018
59	BAL-LOW	3 and 4
60	BAL-LOW	3 and 4
83	BAL-12.5	3 and 5
84	BAL-LOW	3 and 4



Affected lot	BAL Rating	Construction sections to be consulted in AS 3959: 2018
85	BAL-LOW	3 and 4
86	BAL-LOW	3 and 4
87	BAL-LOW	3 and 4
88	BAL-LOW	3 and 4
89	BAL-LOW	3 and 4
90	BAL-LOW	3 and 4
91	BAL-LOW	3 and 4
92	BAL-LOW	3 and 4
93	BAL-LOW	3 and 4
94	BAL-LOW	3 and 4
95	BAL-LOW	3 and 4
96	BAL-LOW	3 and 4
97	BAL-LOW	3 and 4
98	BAL-LOW	3 and 4
99	BAL-12.5	3 and 5
106	BAL-12.5	3 and 5
107	BAL-LOW	3 and 4
108	BAL-LOW	3 and 4
109	BAL-LOW	3 and 4
110	BAL-LOW	3 and 4
111	BAL-LOW	3 and 4
112	BAL-LOW	3 and 4





Affected lot	BAL Rating	Construction sections to be consulted in AS 3959: 2018
113	BAL-LOW	3 and 4
114	BAL-LOW	3 and 4
131	BAL-LOW	3 and 4
132	BAL-LOW	3 and 4
133	BAL-LOW	3 and 4
153	BAL-LOW	3 and 4
154	BAL-LOW	3 and 4
155	BAL-LOW	3 and 4
156	BAL-LOW	3 and 4
157	BAL-LOW	3 and 4
158	BAL-LOW	3 and 4
159	BAL-LOW	3 and 4
160	BAL-LOW	3 and 4
161	BAL-LOW	3 and 4
162	BAL-12.5	3 and 5
169	BAL-12.5	3 and 5
170	BAL-LOW	3 and 4

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





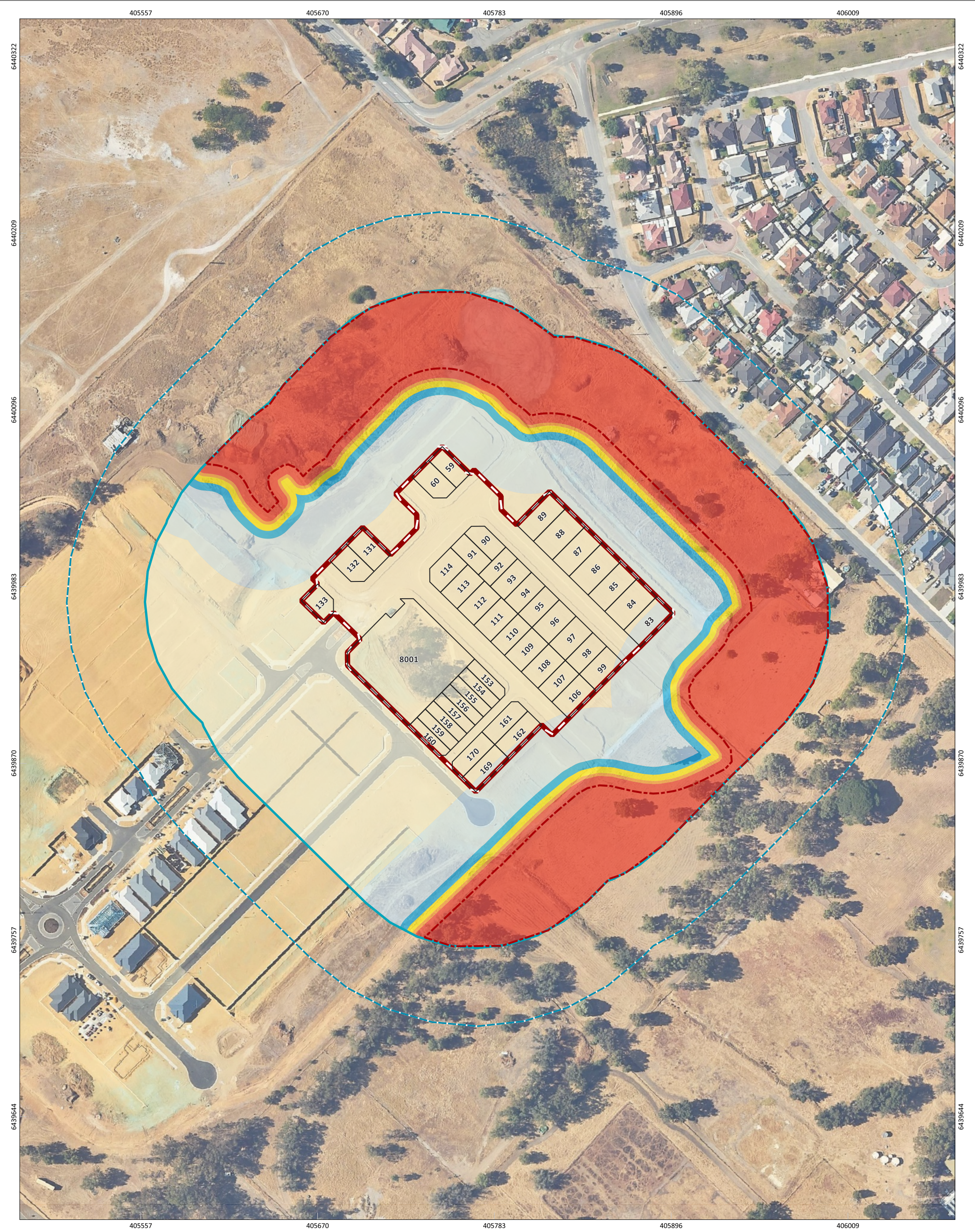


Figure 3: Bushfire Attack Level (BAL) Contours

0

20

40

60

80 m

N

SCALE

1:2,256

SHEET SIZE

A3 COLOUR

COORDINATE REFERENCE SYSTEM

GDA2020 / MGA zone 50

DATA SOURCE

LANDGATE AERIAL IMAGERY Summer 2023

PROJECT/REPORT NAME

BAL Report  
Stage 3 Claravale

CLIENT

Parcel property

PROJECT NUMBER

A23.097

VERSION

0

DRAWN BY / REVIEWED BY

SM/BF

DATE

4/6/2024

Legend

Subject Site

Buffer 100m

Buffer 150m

Bushfire hazard Interface

Lots

Bushfire Attack Level (BAL)

BAL-FZ

BAL-40

BAL-29

BAL-19

BAL-12.5

BAL-LOW

No	Description	Drawn	Approved	Date
A	Original issue	SM	BF	4/6/2024

NOTES:  
Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

WESTERN ENVIRONMENTAL

Western Environmental Pty Ltd

08 6244 2310 | enquiries@westernv.com.au

Level 3/25 Prowse St, West Perth WA 6005

westernv.com.au

G:\GIS\Project Data\A23.097\Stage3\_BAL\A23.097\_Stage3.qgz

COPYRIGHT: This document is and shall remain the property of The Client. This document may only be used for the purpose for which it was commissioned and in accordance with the terms of engagement. The Client does not hold any responsibility for the misuse of this document. Designed and Automated by AC



# **Appendix A**

## **Additional Information / Advisory Notes**





This assessment was undertaken as per AS 3959: 2018. It is important that the current version of AS 3959, is consulted for construction purposes.

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

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
<b>BAL-LOW</b>		There is insufficient risk to warrant specific construction requirements.	4
<b>BAL-12.5</b>	$\leq 12.5 \text{ kW/m}^2$	Ember attack	3 and 5
<b>BAL-19</b>	$>12.5 \text{ kW/m}^2 \leq 19 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux.	3 and 6
<b>BAL-29</b>	$>19 \text{ kW/m}^2 \leq 29 \text{ kW/m}^2$	Increasing levels of ember attack and burning debris ignited by windborne embers together with increasing radiant heat flux	3 and 7
<b>BAL-40</b>	$>29 \text{ kW/m}^2 \leq 40 \text{ kW/m}^2$	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
<b>BAL-FZ</b>	$>40 \text{ kW/m}^2$	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.

