



intelligent outcomes | respected experience

Eglington Hill, Precinct 4, Cells A & B

Bushfire Management Plan (Subdivision Application)

DRAFT

Prepared for
Eglington Hill Pty Ltd
by Strategen

August 2018



Eglington Hill, Precinct 4, Cells A & B

Bushfire Management Plan (Subdivision Application)

DRAFT

Strategen is a trading name of
Strategen Environmental Consultants Pty Ltd
Level 1, 50 Subiaco Square Road Subiaco WA 6008
ACN: 056 190 419

August 2018

Limitations

Scope of services

This report ("the report") has been prepared by Strategen Environmental Consultants Pty Ltd (Strategen) in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen has also not attempted to determine whether any material matter has been omitted from the data. Strategen will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen. The making of any assumption does not imply that Strategen has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

Document control

Client: Eglington Hill Pty Ltd

Report Version	Revision No.	Purpose	Strategen author	Reviewed by	Submitted to Client	
					Form	Date
Draft Report	A	For client review	Carli Turner	Zac Cockerill (BPAD37803)	Electronic (email)	28/08/2018
Draft Report	B	For client review	Carli Turner	Zac Cockerill (BPAD37803)	Electronic (email)	29/08/2018
Final Report						

Filename: URB18358_01 R001 Rev B - 29 August 2018

Table of contents

1. Proposal details	1
1.1 Background	1
1.2 Site description	1
1.3 Purpose	2
1.4 Other plans/reports	2
2. Environmental considerations	5
2.1 Native vegetation – modification and clearing	5
2.2 Revegetation / Landscape Plans	6
3. Bushfire assessment results	7
3.1 Assessment inputs	7
3.1.1 Classified vegetation and effective slope	7
3.2 Assessment outputs	10
4. Identification of bushfire hazard issues	13
4.1 Bushfire context	13
4.2 Bushfire hazard issues	13
5. Assessment against the bushfire protection criteria	14
5.1 Compliance table	14
5.2 Additional management strategies	15
6. Responsibilities for implementation and management of the bushfire measures	17
7. References	19

List of tables

Table 1: Summary of environmental values	5
Table 2: Summary of classified vegetation and exclusions	7
Table 3: Method 1 BAL calculation	10
Table 4: Bushfire protection criteria	14
Table 5: Vehicular access technical requirements	15
Table 6: Developer bushfire management measures– prior to issue of titles	17
Table 7: Bushfire management measures– post issuing of titles	18

List of figures

Figure 1: Plan of subdivision	3
Figure 2: Site overview	4
Figure 3: Post-development vegetation class and effective slope	9
Figure 4: BAL contour map	12

List of appendices

Appendix 1 Site photographs
Appendix 2 City of Wanneroo firebreak notice

1. Proposal details

1.1 Background

Eglinton Hill Pty Ltd (the Proponent) is preparing a subdivision application for proposed development within a portion of Lot 801 Marmion Ave, Eglinton in the City of Wanneroo. The proposed subdivision plan is provided in Figure 1. The subdivision plan identifies:

- 281 lots including residential lots and a commercial local centre
- the internal road layout
- two areas of Public Open Space (POS) and drainage.

1.2 Site description

The project area is designated as bushfire prone on the WA *Map of Bush Fire Prone Areas* (DFES 2018; see Plate 1).



Plate 1: Bush Fire Prone Area mapping as indicated in pink

The project area consists of Precinct 4 within the approved Eglinton Local Structure Plan 82, and is surrounded by (see Figure 2):

- vegetated areas proposed for future urban development in accordance with the approved Alkimos Eglinton District Structure Plan to the north
- Marmion Avenue and vegetated areas proposed for future urban development in accordance with the approved Eglinton Local Structure Plan 82 to the south
- vegetated areas proposed for future urban development in accordance with the approved Eglinton Local Structure Plan 82 to the east
- Amberton Estate residential area opposite Marmion Avenue to the west and southwest, including vegetated areas proposed for imminent development.

Much of the surrounding area is under the Proponent's ownership and therefore is able to be managed where necessary, as discussed further in Sections 5 and 6.

1.3 Purpose

This Bushfire Management Plan (BMP) has been prepared to address requirements under Policy Measure 6.4 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2017).

1.4 Other plans/reports

An EPBC referral (2013/7068) was submitted for the proposed development, including adjacent areas in 2013 (as discussed in Section 2). Department of the Environment (now DoEE) determined the proposal as 'not a controlled action'.

In addition, Strategen has previously prepared the following bushfire management documentation for the project area and adjacent land:

- BMP to accompany a Structure Plan amendment to LSP 82 in July 2016
- BMPs to guide strategic planning (February 2016) and staged subdivision (ongoing) for Amberton Estate
- staged BAL compliance reporting to guide building construction for Amberton Estate (ongoing).



EGLINTON HILL
Draft Plan of Subdivision - Cells A-C

Level 14 The Quadrant, 1 Williamstown Lane, Warrnambool VIC 3240 Australia | +61 8 3946 0000 | URBIS Pty Ltd ABN 60 169 246 226

DATA SOURCE:

PROJECTION:
MGA50

DISCLAIMER:

THIS DOCUMENT IS A PRELIMINARY DRAFT AND IS NOT TO BE USED FOR ANY PURPOSES WITHOUT THE WRITTEN CONSENT OF URBIS. URBIS ACCEPTS NO LIABILITY FOR ANY LOSS OR DAMAGE OF ANY KIND ARISING FROM THE USE OF THIS DOCUMENT.

CLIENT:

Eglington Hill



PROJECT NO: PA1496
DRAWING NO: SD
DATE: 14/08/18
REVISION: A

Figure 1: Plan of subdivision

Date: 15/08/2018

Q:\Consult\2018\URB\URB18358\01_GIS_documents\ArcMap_documents\URB18358_G002_RevA.mxd



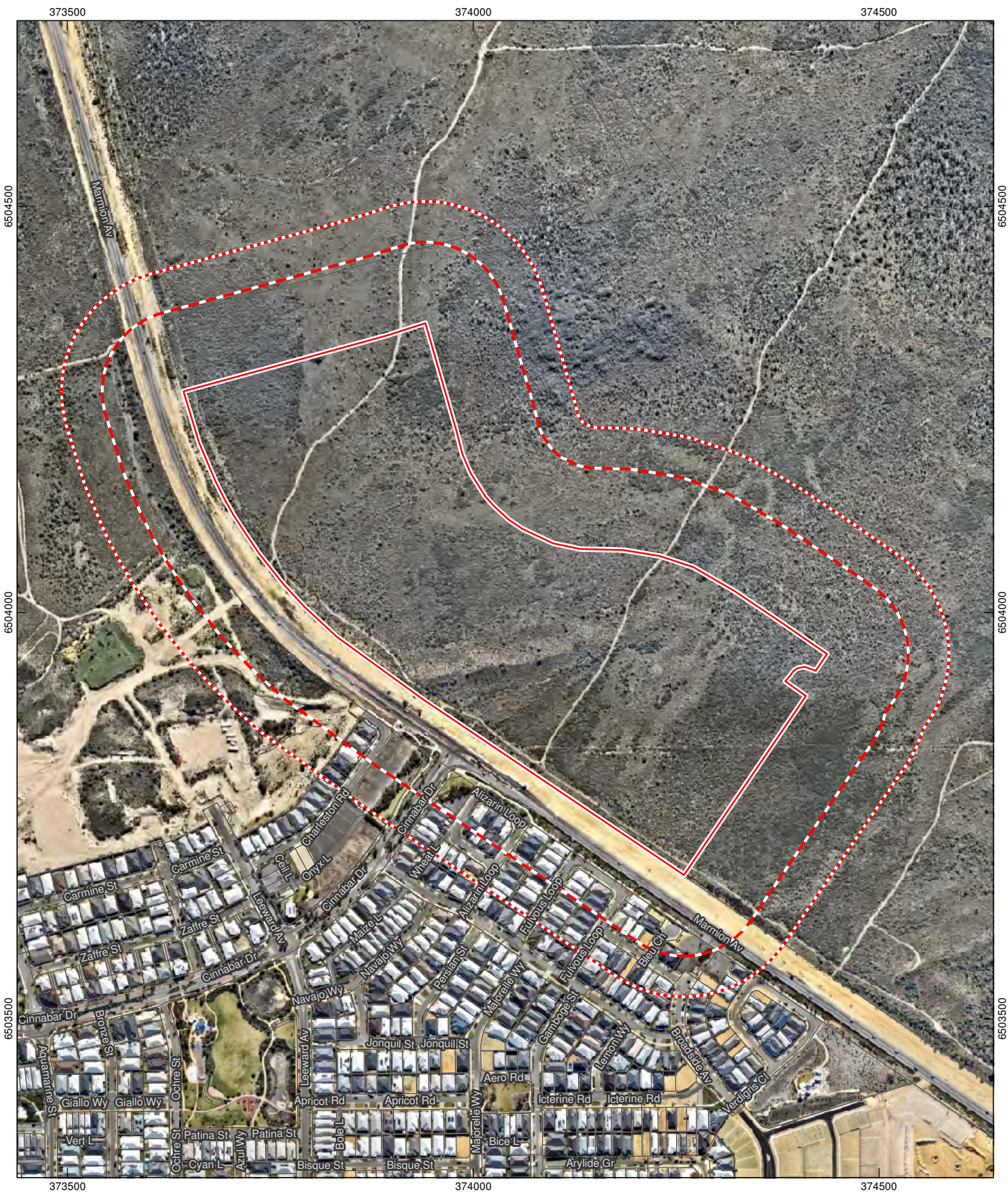


Figure 2: Site Overview

Scale 1:6,330 at A4

Coordinate System: GDA 1994 MGA Zone 50
Date: 15/08/2018

Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastre

2. Environmental considerations

2.1 Native vegetation – modification and clearing

Table 1 provides a summary of a search of publicly available environmental data to determine the presence of any conservation significant environmental attributes.

Table 1: Summary of environmental values

Environmental value	Present within or adjacent to project area (Y/N)	Description
Environmentally Sensitive Area (ESA)	Y	The project area is mapped as an ESA as a result of occurrences of threatened ecological communities (TECs) in the broader area. ESAs are only relevant in the context of exemptions for the requirement of a clearing permit under Part V of the EP Act. Clearing within the project area will be assessed through the subdivision process, which provides a valid exemption regardless of the presence of an ESA.
Wetlands	N	N/A
Waterways	N	N/A
Potential Threatened Ecological Communities listed under the EPBC Act	Unconfirmed	Regional mapping shows the buffer of conservation significant ecological communities occurring within the project area.
Potential habitat for threatened fauna species	Y	The project area may contain potential habitat for the Threatened Carnaby's Black Cockatoo.
DBCA legislated lands and water (includes National Park, Conservation Park, Nature Reserve, marine reserves, State forest and timber reserve)	N	There are no DBCA legislated lands or waters within 150 m of the project area.
DBCA land of interest (includes some areas of UCL, freehold purchased by State and some unvested Crown reserves)	N	There are no DBCA land of interest within 150 m of the project area.
Vegetation associations or complexes with <30% of Pre-European extent remaining outside of constrained areas	N	N/A

Native vegetation occurs across the majority of the project area, with the exception of cleared tracks and firebreaks. Regional vegetation mapping identifies the following two pre-European Beard vegetation associations within the project area:

- Guilderton 1007- shrublands; *Acacia lasiocarpa* and *Melaleuca acerosa* heath/ shrublands; *Acacia rostelifera* and *Acacia cyclops* thicket
- Guilderton 949- low woodland; *banksia*.

The proposed development will necessitate clearing of native vegetation within the project area and adjacent staging buffer, with the possible exception of vegetation retained/created within the large Cell B POS and Cell C POS areas. Any retained or reintroduced vegetation in these POS areas will be designed in accordance with landscape plans to be excludable under a combination of Clauses 2.2.3.2 (b), (e) and (f) of AS3959 (a discussed in Section 2.2). Clearing of native vegetation will be assessed through the subdivision process and will therefore be exempt from requiring a clearing permit under Part V of the *Environmental Protection Act 1986* (EP Act).

An EPBC referral (2010/5777) was submitted for the proposed development, including adjacent areas in 2010, for potential impacts to Carnaby's Black Cockatoo. DoEE approved the proposal with conditions including the creation of Carnaby's cockatoo habitat within POS areas within the project area.

2.2 Revegetation / Landscape Plans

Landscaping within the project area will be limited to the proposed POS and drainage areas, as well as street scaping. As discussed above, any landscaping proposed will consist of vegetation excludable under a combination of Clauses 2.2.3.2 (b), (e) and (f) of AS3959. Detailed landscape planning and design will need to be consistent with the provisions of this BMP with regards to any exclusions/managed land proposed as part of this BMP.

Clause (b) exclusions may be relevant for any proposed vegetation retention/habitat creation within the large Cell B POS and Cell C POS areas. It is anticipated that <1 ha of unmanaged vegetation retention/habitat creation could occur within each of these POS areas, which will be separated from any classified vegetation by 100 m and therefore excludable in accordance with Clause 2.2.3.2 (b). The full extent and location of vegetation retention/habitat creation will be determined through detailed landscape design.

3. Bushfire assessment results

3.1 Assessment inputs

3.1.1 Classified vegetation and effective slope

Strategen assessed classified vegetation and exclusions within 150 m of the project area through on-ground verification on 14 August 2018 in accordance with *AS 3959—2009 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2009). The post-development classified vegetation extent is depicted in Figure 3 and georeferenced site photos are contained in Appendix 1.

Strategen also assessed effective slope under classified vegetation through on-ground verification in accordance with AS 3959. Results are depicted in Figure 3.

A summary of the post-development classified vegetation, effective slope and exclusions are provided in Table 2.

As previously discussed, all POS will be excluded from classification under a combination of Clauses 2.2.3.2 (b), (e) and (f) of AS3959. Detailed landscape planning and design will need to be consistent with the provisions of this BMP with regards to any exclusions/managed land proposed as part of this BMP.

Classified vegetation currently situated within 100 m of the project area to the north, east and south is under control of the proponent and is temporary, subject to future clearing, earthworks and development as part of staged subdivision in accordance with LSP 82. This vegetation is to be modified as part of this subdivision application and associated subdivisional works to form a 100 m wide low threat staging buffer within the balance land along the northern, eastern and southern boundaries. This will mitigate the impact of temporary vegetation and will ensure there is no unnecessary BAL impact on proposed development. The alignment of the staging buffer will take into account any proposed vegetation retention/habitat creation within the large Cell C POS area to the east of the project area to ensure any retained/reintroduced vegetation within this POS can achieve exclusion Clause 2.2.3.2 (b). At this stage, the alignment of the 100 m wide staging buffer has been shown to occur along the subdivision boundary (i.e. northern, eastern and southern boundaries, as per Figure 3); however, this may need to be updated to occur around any additional retained vegetation/habitat creation within Cell C POS once this has been confirmed in accordance with detailed landscape plans.

Furthermore, classified vegetation currently situated within 100 m of the project area to the west (opposite Marmion Avenue and within the Amberton Estate development area) is also temporary and subject to future clearing, earthworks and development as part of staged subdivision within Amberton Estate. However, this vegetation is not under the control of the proponent and cannot be cleared in advance of development by the proponent. Therefore, any interim BAL impact from this vegetation while it remains in situ will need to be catered for as part of proposed development within the project area. Staged clearing of this vegetation and the ultimate reduction in BAL impact can be captured as part of the future BAL compliance processes (as discussed in Section 5.2).

Table 2: Summary of classified vegetation and exclusions

Vegetation plot	Applied vegetation classification/exclusion	Effective slope under the classified vegetation (degrees)
1	Excluded Clause 2.2.3.2 (e) and (f)	N/A
2	Class D scrub	Flat/ upslope
3	Class C shrubland	Flat/ upslope
4	Class C shrubland	Downslope 0 to 5 degrees
5	Class C shrubland	Flat/ upslope
6	Class C shrubland	Flat/ upslope
7	Class D scrub	Downslope 0 to 5 degrees
8	Class C shrubland	Downslope 0 to 5 degrees

Vegetation plot	Applied vegetation classification/exclusion	Effective slope under the classified vegetation (degrees)
9	Class C shrubland	Flat/ upslope

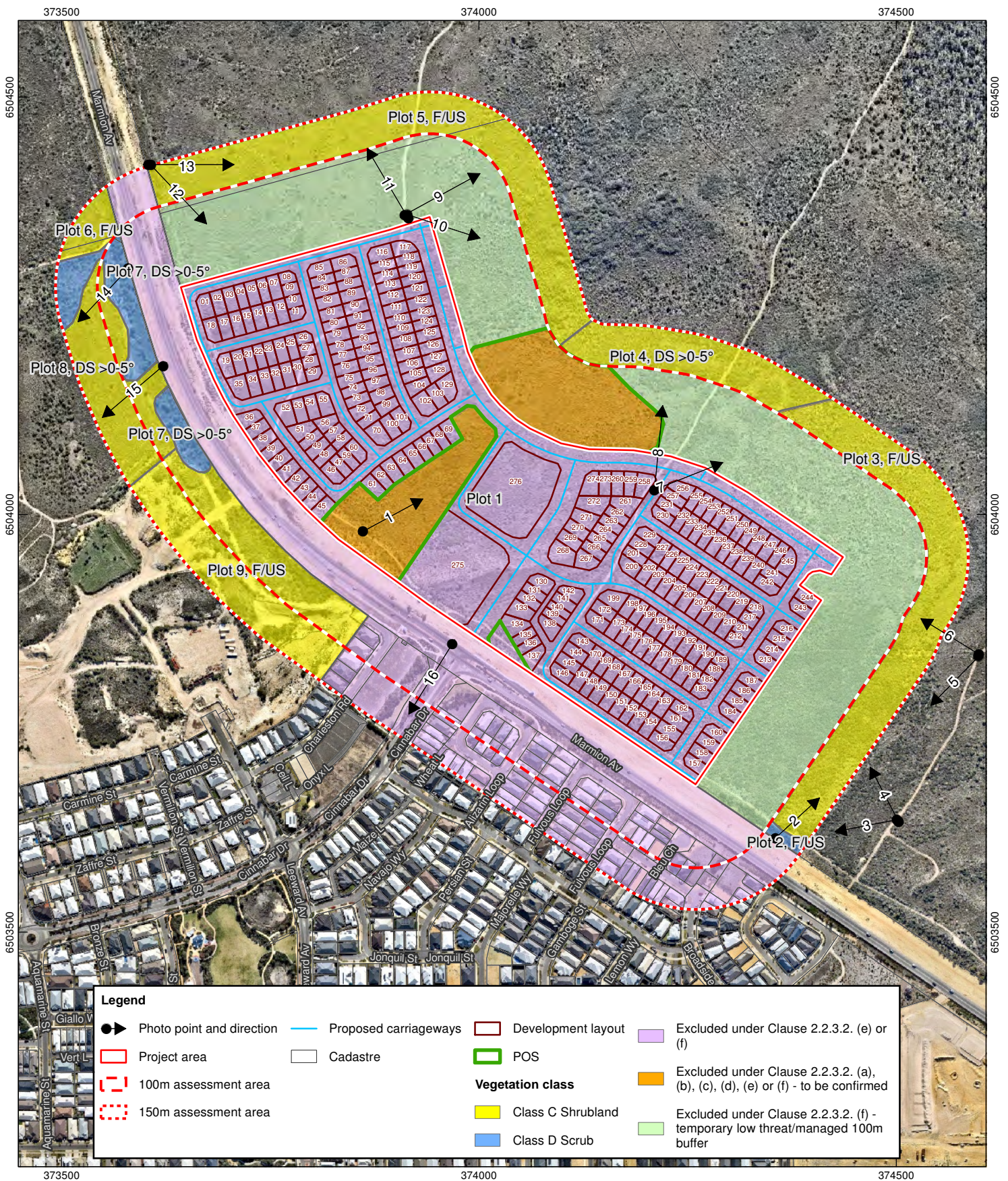
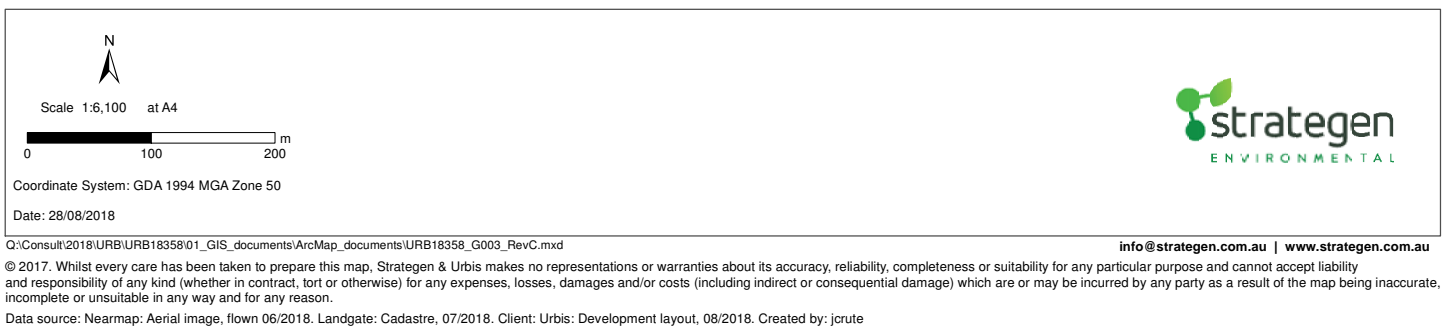


Figure 3: Post-development vegetation class and effective slope



3.2 Assessment outputs

Any proposed habitable buildings that cannot achieve a full 100 m wide low fuel separation distance from post development classified vegetation will require application of AS 3959 to determine appropriate siting of development and potential increased building construction standards in response to the assessed BAL. Strategen has undertaken a BAL contour assessment for the project area in accordance with Method 1 of AS 3959 and Appendix 3 of the Guidelines. The Method 1 procedure for calculating the BAL (as outlined in AS 3959) incorporates the following factors:

- WA State adopted FDI 80 rating
- vegetation classification
- effective slope
- distance maintained between proposed development areas and the classified vegetation.

The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed development and subsequently informs the standard of building construction and/or setbacks required for proposed habitable development to potentially withstand such impacts. Strategen recognises that mandatory compliance of proposed buildings with the AS 3959 building construction standards will not be formally required for all buildings in this development, such as those that are not a Class 1, 2, 3 or associated Class 10a building under the National Construction Code (e.g. commercial buildings). Voluntary compliance for these buildings will be at the discretion of each individual proponent but is encouraged where practicable.

The assessed BAL contours are depicted in Figure 4.

The width of each BAL contour is set in accordance with AS 3959 and reflects the relevant BAL rating applicable to the respective Class D scrub and Class C shrubland vegetation types situated on the various assessed slopes (as per Figure 3). Where BAL contours differ based on the different BAL application distances associated with the vegetation classifications, the highest (worst case) BAL has been applied.

The BAL contours are based on the vegetation class and effective slope assessed at the time of inspection and take into consideration the vegetation exclusions and separation distances achieved in line with the subdivision plan following development works, including the proposed 100 m wide low threat staging buffer to the north, east and south of the project area, as depicted in Figure 3. Should there be any changes in development design or classified vegetation extent that results in a modified BAL outcome, then the BAL contours will need to be reassessed for the affected areas and documented in a brief addendum to this BMP prepared to accompany a future planning/building application.

Table 3: Method 1 BAL calculation

Classified vegetation	Effective slope	Relevant plot numbers	BAL contour width (m)	Highest BAL rating (to lot boundary)	Comment
Class C shrubland	Flat/ upslope	Plot 3, 5, 6 and 9	<10	BAL-FZ	No development is proposed in this area
			10-<13	BAL-40	No development is proposed in this area
			13-<19	BAL-29	No development is proposed in this area
			19-<27	BAL-19	No development is proposed in this area
			27-<100	BAL-12.5	Development will occur in this area
	Downslope 0 to 5 degrees	Plot 4 and 8	<7	BAL-FZ	No development is proposed in this area
			7-<10	BAL-40	No development is proposed in this area
			10-<15	BAL-29	No development is proposed in this area
			15-<22	BAL-19	No development is proposed in this area
			22-<100	BAL-12.5	Development will occur in this area
Class D scrub	Flat/ upslope	Plot 2	<10	BAL-FZ	No development is proposed in this area
			10-<13	BAL-40	No development is proposed in this area

Downslope 0 to 5 degrees	Plot 7	13-<19	BAL-29	No development is proposed in this area
		19-<27	BAL-19	No development is proposed in this area
		27-<100	BAL-12.5	Development will occur in this area
		<11	BAL-FZ	No development is proposed in this area
		11-<15	BAL-40	No development is proposed in this area
		15-<22	BAL-29	No development is proposed in this area
		22-<31	BAL-19	No development is proposed in this area
		31-<100	BAL-12.5	Development will occur in this area

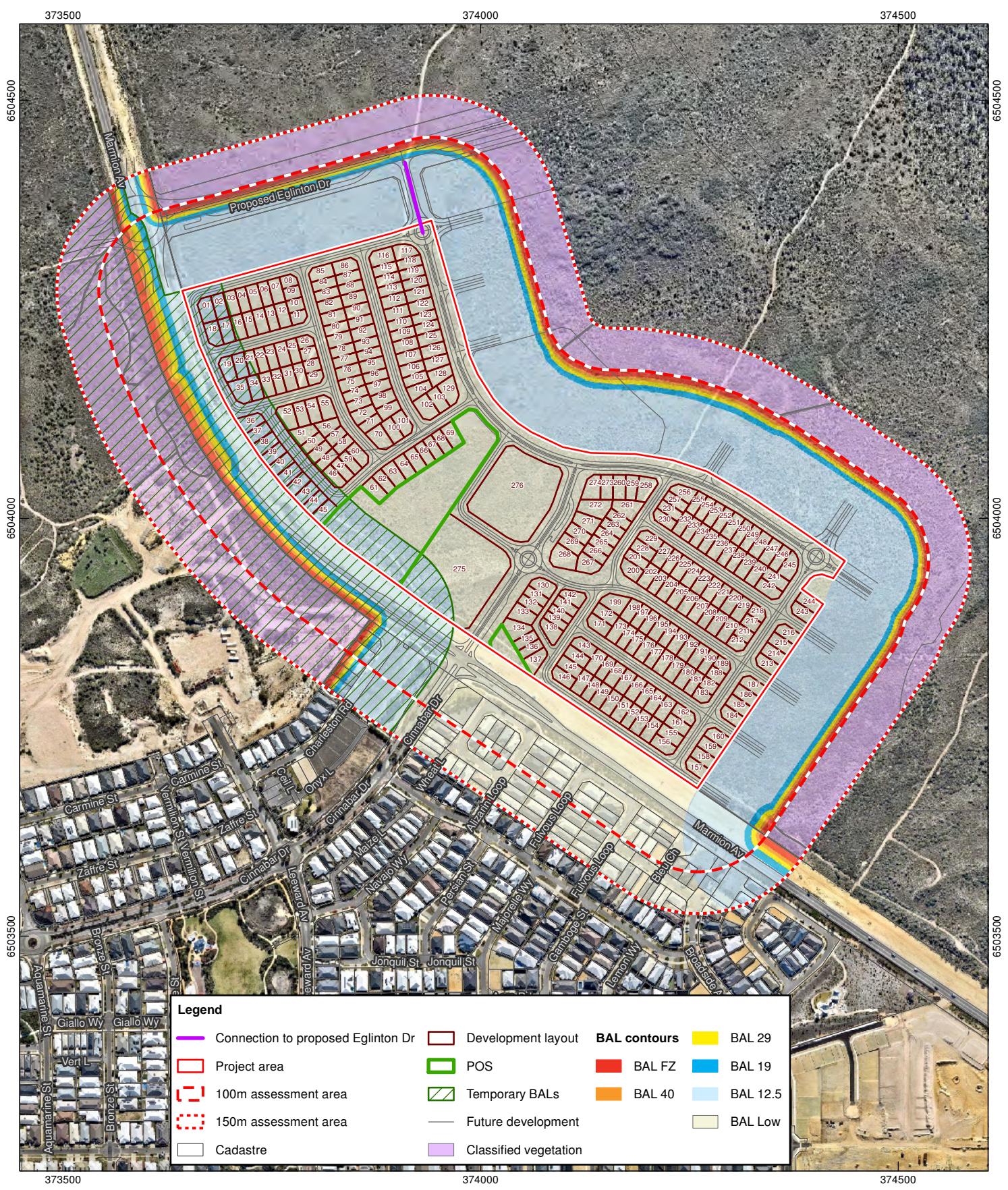


Figure 4: BAL contour map



 Scale 1:6,100 at A4



 Coordinate System: GDA 1994 MGA Zone 50

 Date: 28/08/2018



4. Identification of bushfire hazard issues

4.1 Bushfire context

Much of the surrounding local area is proposed to be developed in accordance with the Alkimos Eglington District Structure Plan in subsequent years. Until development occurs, classified vegetation identified within the project area and surrounding local area has the potential to pose a bushfire risk on the proposed development if unmanaged.

There is a temporary bushfire hazard associated with remnant coastal heath vegetation to the north, east and south of the project area within areas proposed to be developed in future as part of LSP 82. Until such time that the surrounding areas are developed, there is the potential for extended fire runs (over 10 km) through vegetation, particularly to the north and the southeast.

4.2 Bushfire hazard issues

Given the above, any development within 100 m of classified vegetation should incorporate suitable levels of defensible space, compliant APZs, access provisions, fire fighting water supply and increased building construction standards where necessary.

The proposed development will incorporate a 100 m wide low threat staging buffer at the northern, eastern and southern vegetation interfaces, which will be managed on a regular and ongoing basis in accordance with Clause 2.2.3.2 (f) of AS3959.

Development west of Marmion Avenue within Amberton Estate will occur prior to or concurrently with development of the project area, and classified vegetation will be removed in this area prior to reassessment of the BAL ratings as part of BAL compliance following subdivision works. As such, BAL contours associated with vegetation west of Marmion Avenue have been shown as temporary. In the event that this hazard remains at the time of reassessment during the BAL compliance check, the BAL ratings and associated building construction standards depicted on Figure 4 will apply to the affected lots.

The proposed development will include an internal road network that will connect to Marmion Avenue near Cinnebar Drive at the western project area boundary, and also to Eglington Drive to the north (which will be constructed concurrently with this project stage), thus providing two access/egress points in two different directions.

The proposed development will be connected to reticulated water supply that will be extended from surrounding areas of existing urban residential development. The proposed internal road network will be provided with street hydrants to the relevant standards of the Guidelines and Water Corporation, as outlined in Table 4.

Following provision of these design measures, Strategen considers the bushfire risk and associated hazards are manageable through adoption of standard Guideline acceptable solutions.

5. Assessment against the bushfire protection criteria

5.1 Compliance table

An acceptable solutions assessment against the bushfire protection criteria is provided in Table 4.

Table 4: Bushfire protection criteria

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
Element 1: Location	A1.1 Development location	The BAL contour assessment (see Figure 4 and Table 3) identifies all lots as having adequate separation from classified vegetation to achieve a rating of BAL-29 or lower.
Element 2: Siting and design	A2.1 Asset Protection Zone	The BAL contour assessment identifies all development as having the capacity to achieve BAL-29 or lower through the provision of staging buffers and perimeter access roads. No additional APZ provisions under acceptable solution A2.1 are required for proposed development to meet compliance with Element 2.
Element 3: Vehicular access	A3.1 Two access routes.	A combination of existing perimeter roads and the proposed internal vehicle access network will provide all occupants with the option of travelling to more than two different destinations. The proposed development will connect to Marmion Avenue near Cinnebar Drive at the western project area boundary, and also to Eglington Drive to the north (which will be constructed concurrently with this project stage), thus providing two access/ egress points in two different directions. Marmion Avenue provides access/ egress to the north and south, while Eglington Drive will connect to both Marmion Avenue and future development stages to the east.
	A3.2 Public road	All public roads will be constructed to meet the relevant technical requirements under the Guidelines (see Table 5)
	A3.3 Cul-de-sac (including a dead-end-road)	N/A It is noted that several temporary 'dead-end' roads are proposed at the southern project area boundary that are proposed to connect to adjacent development stages. These roads are no longer than 30 m and all lots abutting these 'dead-end' roads' are also provided with frontage onto an interconnecting through road. It is therefore considered that cul-de-sac heads are not required.
	A3.4 Battle-axe	N/A No battle axe lots are proposed as part of the proposed subdivision.
	A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements contained within the Guidelines	All proposed residential lots will have private driveways <50 m in length. In the event that private driveways longer than 50 m are proposed for the commercial site or terrace/unit site, these will be constructed to relevant technical requirements under the Guidelines (see Table 5).
	A3.6 Emergency access way	No emergency access ways (EAW) are proposed; however, if development and vehicle access construction is to be staged, any proposed temporary EAW will be constructed to relevant technical requirements under the Guidelines (see Table 5).
	A3.7 Fire service access routes (perimeter roads)	N/A No FSARs are proposed or required as part of the proposed subdivision.

Bushfire protection criteria	Method of compliance	Proposed bushfire management strategies
	Acceptable solutions	
	A3.8 Firebreak width	<p>Given that all lots will be cleared and developed, lot boundary firebreaks will not be required within proposed residential lots.</p> <p>Given that the proposed central POS area is > 0.5 ha, and will contain up to <1 ha of vegetation, a firebreak that is 3 m wide, with 4 m vertical clearance, will be required in accordance with the Guidelines and associated City of Wanneroo annual firebreak notice. It is anticipated that the firebreak could be a trafficable, non-flammable surface that could be incorporated into detailed landscape design at the discretion of the City. The firebreak should ensure separation at any residential/commercial buildings and vegetation interfaces.</p>
Element 4: Water	A4.1 Reticulated areas	Future development will be connected to reticulated water supply via extension of services from surrounding development areas. Existing water hydrants are located at 200 m intervals along Marmion Avenue and within Amberton Estate to the west of the project area.
	A4.2 Non-reticulated areas	N/A
	A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)	N/A

Table 5: Vehicular access technical requirements

Technical requirement	Public road	Cul-de-sac	Private driveway	Emergency access way	Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius	8.5	8.5	8.5	8.5	8.5

* Refer to E3.2 Public roads: Trafficable surface

5.2 Additional management strategies

Strategen makes the following additional recommendations to inform ongoing planning stages of the development and increase the level of bushfire risk mitigation across the site:

1. **Low threat staging buffers:** if development (and therefore clearing) is to occur on a staged basis, clearing in advance will need to occur to ensure building construction is not inhibited by a temporary vegetation extent located within adjacent development stages yet to be cleared. This can be achieved by ensuring that each approved stage subject to construction is surrounded by a 100 m wide, on-site cleared or low threat buffer prior to development (not including vegetation proposed to be retained). Once the buffers are created, they will need to be maintained on a regular and ongoing basis at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition all year round until such time that the buffer area is developed as part of the next development stage. This will assist in managing the current on-site temporary vegetation hazards.

1. Vehicle access staging: if development (and therefore construction of vehicle access) is to occur on a staged basis, vehicle access arrangements will need to ensure that all occupiers and visitors are provided with at least two vehicular access routes at all stages. This can be achieved via construction of access in advance of stages or through provision of temporary emergency access ways until two formal access roads are available.
2. Fuel management within cleared vacant lots: cleared lots will be managed on a regular and ongoing basis by the developer until sale of lots after which time landowners will be responsible for ongoing management. Management will involve slashing/mowing of grassland and weeds to height of less than 10 cm.
3. Road verge fuel management: existing and proposed road verges that have been excluded as low threat will need to be managed to ensure the understorey and surface fuels remain in a low threat, minimal fuel condition in accordance with Clause 2.2.3.2 (f) of AS 3959. Ongoing road verge management is the responsibility of the City.
4. Notification on title: notification is to be placed on the Title of proposed lots subject to BAL-12.5 or higher (either through condition of subdivision or other head of power) to ensure landowners/proponents and prospective purchasers are aware that their lot is subject to an approved BMP and BAL assessment, however, since the lot is situated within a designated bushfire prone area (at creation of title), the BAL for proposed buildings may, at the discretion of the City, need to be confirmed at the development application or building permit stage.
5. Building construction standards: development of Class 1, 2, 3 and associated Class 10a buildings will require compliance with the construction requirements of AS 3959, relevant to the assessed BAL.
6. BAL compliance and/or individual lot BAL assessment at future stages: a BAL compliance report and/or individual lot BAL assessment may be prepared at the discretion of the City/ WAPC following completion of subdivisional works and prior to lot title to validate and confirm the accuracy of BAL assessments depicted in the BMP or demonstrate any change in the assessed BAL or other management measures documented in this BMP, which may occur as a result of changes in building location, vegetation class or bushfire management approach.
7. Compliance with annual firebreak notice: the developer/land manager and prospective land purchasers are to comply with the current City annual firebreak notice (refer to Appendix 2).
8. Preparation of detailed landscape plans: the developer will need to ensure that the location and extent of any retained/reintroduced vegetation throughout POS/drainage areas complies with the provisions of this BMP and any proposed vegetation exclusions through preparation of detailed landscape plans.

6. Responsibilities for implementation and management of the bushfire measures

Table 6: Developer bushfire management measures– prior to issue of titles

Developer – prior to issue of titles		
No.	Implementation action	Subdivision clearance
1	Implement all necessary clearing, earthworks and staging buffers as per the BMP to ensure all relevant vegetation within and adjacent to development stages is excludable under Clause 2.2.3.2 of AS3959 to achieve a rating of BAL-29 or lower for all development (to be assessed as part of BAL compliance reporting)	<input type="checkbox"/>
2	Prepare detailed POS landscape plans that adhere to the provisions of this BMP and demonstrate the relevant vegetation exclusions throughout POS	
3	Construct the public roads to the standards stated in the BMP.	<input type="checkbox"/>
4	If development and vehicle access construction is to be staged and do not provide two access/egress routes, construct temporary EAW to relevant technical requirements under the Guidelines	<input type="checkbox"/>
5	Connect development to reticulated water supply as per the standards stated in the BMP	<input type="checkbox"/>
6	Undertake post subdivision works BAL assessment to validate and confirm the accuracy of BAL assessments depicted in the BMP	<input type="checkbox"/>

Certification by Bushfire Consultant

I _____ certify that at the time of inspection, the BAL ratings contained within this BMP are correct; and implementation actions 1 – 3 have been undertaken in accordance with the BMP.

Clearance is recommended.

Signature: _____ Date: _____

Table 7: Bushfire management measures– post issuing of titles

Landowner/Developer – prior to sale or occupancy	
No.	Implementation action
1	Maintain the project area and associated low threat staging buffers in a cleared or excludable state in accordance with exclusions under Clause 2.2.3.2 of AS3959 until future stages progress and the buffers can be relinquished.
Landowner/occupier – post title, ongoing	
No.	Management action
1	Maintain lot in a cleared or excludable state in accordance with exclusions under Clause 2.2.3.2 of AS3959
2	Comply with the relevant local government annual firebreak notice issued under s33 of the Bush Fires Act 1954.
3	If required, construct any private driveways longer than 50 m to the relevant technical requirements under the Guidelines (potentially applicable to the commercial site or terrace/unit site).
4	Ensure any Class 1, 2, 3 and associated 10a buildings meet the relevant construction requirements of AS 3959, as per the final assessed BAL rating.
Local government – ongoing management	
No.	Management action
1	Continued management of Marmion Avenue road reserve to ensure the vegetation remains as low threat vegetation, in accordance with Clause 2.2.3.2 (f) of AS3959.
WAPC	
1	Place a notification on the Title of proposed lots subject to BAL-12.5 or higher (either through condition of subdivision or other head of power) to ensure landowners/proponents and prospective purchasers are aware that their lot is subject to an approved BMP and BAL assessment.

7. References

Department of Fire and Emergency Services (DFES) 2018, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: <https://maps.slip.wa.gov.au/landgate/bushfireprone/>

Standards Australia (SA) 2009, *Australian Standard AS 3959–2009 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.

Western Australian Planning Commission (WAPC) 2017, *Guidelines for Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.

Appendix 1
Site photographs



Photo Point 1: Class C shrubland in central POS area, will be excludable post-development



Photo Point 2: Class D scrub to south-east of project area



● -31.595753, 115.676966 ±6m



Photo Point 3: Class C shrubland to the south-east of project area



● -31.595743, 115.676961 ±4m



Photo Point 4: Class C shrubland to the south-east of project area



● -31.59371, 115.67823 ±4m



Photo Point 5: Class C shrubland to the east of project area



● -31.593715, 115.678234 ±4m



Photo Point 6: Class C shrubland to the east of project area



● -31.592215, 115.673922 ±4m



14 Aug 2018, 12:11:14

Photo Point 7: Class C shrubland to the north-east of project area



● -31.592215, 115.673922 ±4m



14 Aug 2018, 12:11:11

Photo Point 8: Class D scrub to the north-east of project area



Photo Point 9: Class C shrubland to the north of project area



Photo Point 10: Class C shrubland to the north of project area



Photo Point 11: Class C shrubland to the north of project area



Photo Point 12: Class C shrubland to the north of project area



Photo Point 13: Class C shrubland to the north of project area



Photo Point 14: Class D scrub to the west of project area



Photo Point 15: Class C shrubland to the west of project area



Photo Point 16: Managed landscaped areas excluded under Clause 2.2.3.2 (e) and (f) to the west of project area

Appendix 2

City of Wanneroo firebreak notice

Under the Bushfires Act (1954), all owners and occupiers of land in Western Australia must establish and maintain fire breaks.

Fire breaks and protection measures are vital in assisting the prevention of fires spreading and to allow safer access for bushfire fighters and vehicles.

Land with an area of less than 4,000m²

- A fire break, not less than three (3) metres wide must be cleared immediately inside (or as close as possible) and around all external boundaries of the land.
- All tree branches that over-hang a fire break must be trimmed back to a minimum height of three and a half (3.5) meters above ground level and the growth on the fire break cannot exceed fifty (50) millimeters high.

Land with an area of 4,000m² or more

- A fire break, not less than three (3) metres wide, must be cleared immediately inside (or as close as possible) around all external boundaries of the land.
- All tree branches that over-hang a fire break must be trimmed back to a minimum height of three and a half (3.5) meters above ground level and the growth on the fire break cannot exceed fifty (50) millimeters high.

Buildings

- Install and maintain a twenty (20) meter building protection zone surrounding all buildings, large hay stacks and fuel storage areas. A building protection zone includes undertaking measures such as pruning all lower tree branches to prevent fire entering the trees, ensuring three (3) meter spacing between tree canopies to prevent treetop fires spreading between trees, keeping all grasses to a height of not more than fifty (50) millimeters and storing all firewood piles more than twenty (20) meters away from the buildings.

APPLICATION TO VARY THE ABOVE REQUIREMENTS

If it is considered impracticable for any reason to implement any of the requirements of this Notice, application may be made not later than the 18th of October annually to the Council or its authorised officer for permission to provide alternative fire protection measures. If permission is not granted the requirements of this Notice must be complied with.

ADDITIONAL WORKS

In addition to the requirements of this Notice, you may be required to carry out further works which are considered necessary by an Authorised Officer and specified by way of a separate written notice forwarded to the address of the owner/s as shown on the City of Wanneroo rates record for the relevant land.



Minimum clearances 3.5m above ground level dependent upon land area.



Non-compliant: no fire break installed inside boundary fence



Compliant: grass slashed to ground level



Non-compliant: mineral earth fire break showing grass/weed regrowth



Compliant: mineral earth fire break



Non-compliant: thick scrub creates a fire hazard around power poles



Compliant: cleared buffer zone around power poles

