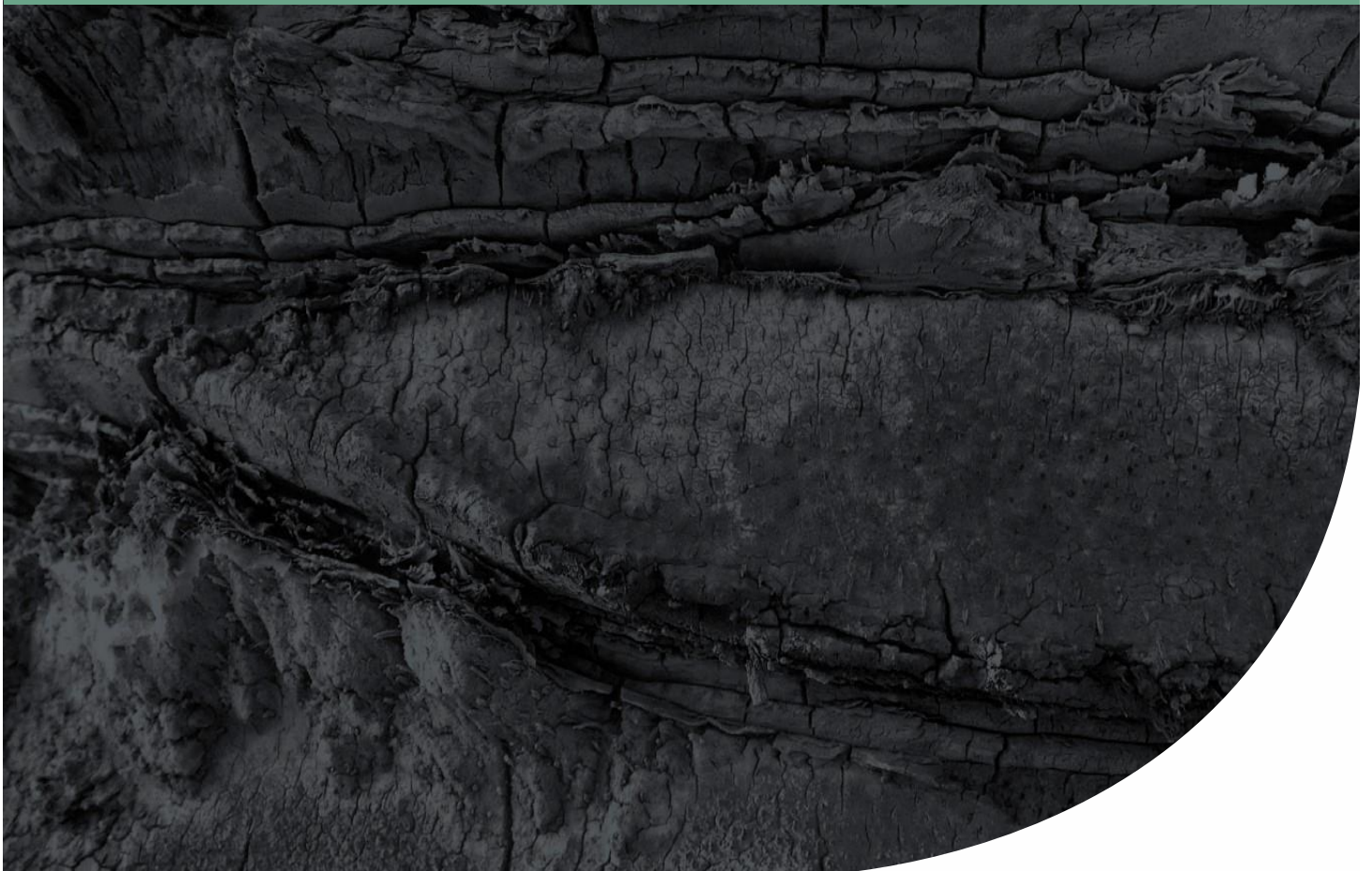


Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2

Project No: EP17-001(18)

**Prepared for Lendlease
June 2020**



Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Document Control

Doc name: Bushfire Management Plan Alkimos Vista Subdivision Stages 1 and 2					
Doc no.: EP17-001(18)--035 DAE					
Version	Date	Author		Reviewer	
1	June 2020	Dana Elphinstone	DAE	Anthony Rowe	AJR
Draft report for client review					

Disclaimer:

This document has been prepared in good faith and is derived from information sources believed to be reliable and accurate at the time of publication. Nevertheless, it is distributed on the terms and understanding that the author is not liable for any error or omission in the information sources available or provided to us, or responsible for the outcomes of any actions taken based on the recommendations contained herein. It is also expected that our recommendations will be implemented in their entirety, and we cannot be held responsible for any consequences arising from partial or incorrect implementation of the recommendations provided.

This document has been prepared primarily to consider the layout of development and/or the appropriate building construction standards applicable to development, where relevant. The measures outlined are considered to be prudent minimum standards only based on the standards prescribed by the relevant authorities. The level of bushfire risk mitigation achieved will depend upon the actions of the landowner or occupiers of the land and is not the responsibility of the author. The relevant local government and fire authority (i.e. Department of Fire and Emergency Services or local bushfire brigade) should be approached for guidance on preparing for and responding to a bushfire.

Notwithstanding the precautions recommended in this document, it should always be remembered that bushfires burn under a wide range of conditions which can be unpredictable. An element of risk, no matter how small, will always remain. The objective of the Australian Standard AS 3959-2018 is to "prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire while the front passes" (Standards Australia 2018). Building to the standards outlined in AS 3959 does not guarantee a building will survive a bushfire or that lives will not be lost.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Executive Summary

The Bushfire Management Plan (BMP) has been prepared on behalf of Lendlease (the proponent) to support the lodgement of a development application for a subdivision. The subject site is part 500K Alkimos Drive, Alkimos (Lot 9004 on Plan P416641), referred to as 'the site' and shown in **Figure 1** and **Appendix A**.

The Commercial Assessment Plan indicates that the future development of the site will include residential lots, an urban road network, public open space (POS) and a primary school. The current subdivision is separated by a rail corridor that is currently under construction.

The site comprises a total area of approximately 44 hectares (ha) and is located approximately 48 km north-west of the Perth Central Business District (CBD), as shown in **Figure 1**. The site is bound by Marmion Avenue to the west, private landholdings to the north and regional open space owned by the Western Australian Planning Commission to the east and south.

Part of the site is currently identified as a "Bushfire Prone Area" under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2017). The identification of Bushfire Prone Areas within any portion of the site requires further assessment of the bushfire hazard implications on the proposed development to be undertaken in accordance with *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017) and *Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas* (AS 3959) (Standards Australia 2018).

The purpose of SPP 3.7 is to preserve life and reduce the impact of bushfire on property and infrastructure through effective risk-based land-use planning. This BMP examines the likely long-term bushfire risk (following development) and the risk mitigation measures that will ensure the land is suitable for its intended purpose.

The majority of the site has been cleared of standing vegetation and is generally maintained in a low threat condition. There are areas of regrowth limited to Grassland in the eastern precinct of the subdivision. Development in the western precinct has started with an existing road connection to Marmion Avenue and limited residential lots and access. External the site, Forest vegetation has been identified to the north, with extensive Scrub vegetation to the north, east, south and west.

For the purpose of this assessment, a post-development vegetation classification scenario has been assumed in order to determine the likely medium-to-long-term bushfire risk posed to development within the site. As part of this, it has been assumed that all classified vegetation within the site will be managed to a 'low threat' standard or other exclusion criteria as part of future residential development, with the exception of vegetation within the public open space on the southern boundary of the Western Precinct. This includes public open space (POS) areas, which will be landscaped and maintained to achieve a low threat classification, initially by the proponent and then by the City of Wanneroo following handover.

The post-development scenario also assumes that the POS on the southern boundary of the Western Precinct will be revegetated to a 'Scrub' classification, to represent a worst-case bushfire hazard

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



scenario. This POS adjoins the ROS land managed by WAPC, which is vegetated with extensive Scrub and some areas of Shrubland vegetation.

In addition to the above, classified vegetation identified within 100 m to the north of the site on land owned by the proponent identified for future stages of development, has been assumed that this land will be managed to a 'low threat' standard until residential development progresses in these areas.

The outcomes of this BMP demonstrate that as development progresses, it will be possible for an acceptable solution to be adopted for each of the applicable bushfire protection criteria outlined in the Guidelines. This includes:

- **Location:** future development will be located in an area that will, on completion, able to achieve separation for BAL-29 development or below.
- **Siting and Design:** all future dwellings can be sited within the proposed development so that BAL-29 or less can be achieved based on the proposed Master Plan.
- **Vehicular Access:** Safe vehicular access to the site will ultimately be provided through multiple public roads connecting to the north and west of the site, which then connects to the broader public road network. In the interim whilst these roads remain unconstructed, primary access to the site will be provided through the existing access to Marmion Avenue, and a new road from the Eastern Precinct to the Western Precinct; secondary access is required to be addressed through a temporary emergency access way or fire services access road.
- **Water:** the development will be provided with a permanent and reticulated water supply to support onsite firefighting requirements.

The management/mitigation measures to be implemented through the proposed subdivision of the site have been outlined as part of this BMP. Following certification, the BAL ratings determined within this BMP (or as part of future stage-based BAL assessments) can be used to support future building approval processes.

The management/mitigation measures to be implemented as part of the future development of the site have been outlined in this BMP, and demonstrate that the bushfire protection criteria can be satisfied following SPP 3.7 and the Guidelines. Following approval of the subdivision, further detailed planning will need to be undertaken, including the preparation of subdivision applications. This BMP is intended to not only support the preparation of the subdivision application, but to also guide future development, and identify the future planning considerations required from a bushfire perspective.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table of Contents

Executive Summary	ii
1 Proposal Details	1
1.1 Aim of this document.....	2
1.2 Statutory policy and framework	2
1.3 Description of the proposed development.....	3
1.4 Description of the land characteristics	3
2 Environmental Considerations	4
2.1 Native vegetation – modification and clearing.....	5
2.2 Revegetation and landscape plans	5
3 Bushfire Assessment Results	6
3.1 Bushfire Hazard Level assessment.....	6
3.1.1 Assessment inputs.....	7
3.1.1.1 Post-development assumptions.....	16
3.1.2 Assessment outputs	17
4 Identification of bushfire hazard issues	18
5 Assessment against the Bushfire Protection Criteria	19
5.1 Additional management strategies.....	24
5.1.1 Future approval considerations	24
5.1.2 Landscape management	24
1.1.1.1 Within the site.....	24
5.1.2.1 Surrounding the site.....	26
5.1.3 City of Wanneroo Fire Notice.....	26
5.1.4 Vulnerable or high-risk land uses.....	26
5.1.5 Public education and preparedness.....	27
6 Responsibilities for Implementation and Management of Bushfire Measures	28
7 Applicant Declaration	29
7.1 Accreditation.....	29
7.2 Declaration.....	29
8 References	30
8.1 General references	30
8.2 Online references.....	30

List of Tables

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases and site-specific information).....	4
Table 2: Vegetation classification, effective slope and future management	8
Table 3: Setback distances for BAL ratings based on post-development vegetation classifications (Figure 3) and effective slope, as determined by the method 1 BAL assessment and Table 2.4.3 of AS 3959.....	17
Table 4: Summary of bushfire protection criteria and compliance statement	20
Table 5: Responsibilities for the implementation of the BMP	28

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



List of Plates

Plate 1: Areas within and surrounding the site identified as “Bushfire Prone Areas” (OBRM 2019).....	1
Plate 2: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)	7

Figures

- Figure 1: Site Location and Topographic Contours
- Figure 2: Existing Conditions - AS 3959 Vegetation Classifications
- Figure 3: Pre-Development Site Conditions - Bushfire Hazard Level
- Figure 4: Post Development Site Conditions – AS 3959 Vegetation Classifications
- Figure 5: Post Development Site Conditions – Effective Slope
- Figure 6: Post Development Site Conditions – Bushfire Attack Level Contours

Appendices

Appendix A

Commercial Assessment Plan

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



List of Abbreviations

Table A1: Abbreviations – General terms

General terms	
AHD	Australian Height Datum
AS	Australian Standard
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BHL	Bushfire Hazard Level
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
CCW	Conservation category wetland
EEP	Emergency Evacuation Plan
ESA	Environmentally Sensitive Area
ESL	Emergency Services Levy
FDI	Fire Danger Index
FZ	Flame Zone
TEC	Threatened ecological community

Table A2: Abbreviations – Organisations

Organisations	
DBCA	Department of Biodiversity Conservation and Attractions
DWER	Department of Water and Environmental Regulation
DFES	Department of Fire and Emergency Services
DPLH	Department of Planning, Lands and Heritage
OBRM	Office of Bushfire Risk Management
WAPC	Western Australian Planning Commission

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table A3: Abbreviations – Legislation and policies

Legislation	
Guidelines	<i>Guidelines for Planning in Bushfire Prone Areas version 1.3</i> (WAPC and DFES 2017)
SPP 3.7	<i>State Planning Policy 3.7 Planning in Bushfire Prone Areas</i> (WAPC 2015)

Table A4: Abbreviations – Planning and building terms

Planning and building terms	
AS 3959	Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas (Standards Australia 2018)
SP	Structure Plan
POS	Public Open Space
LPS	Local Planning Scheme
Lakelands East	Lakelands East Outline Development Plan

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



1 Proposal Details

Lendlease (the proponent) intend to progress residential development within part 500K Alkimos Drive, Alkimos (herein referred to as “the site”), following the proposed subdivision plan, attached as **Appendix A**. The site comprises a total area of approximately 44 hectares (ha) and is located approximately 48 km north-west of the Perth Central Business District (CBD), as shown in **Figure 1**. The site is bound by private landholdings to the north, regional open space to the east and south, and Alkimos Drive to the east. The site is separate in the middle by a rail corridor that is currently being developed.

Part of the site is currently identified as a “Bushfire Prone Area” under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2019), as shown in **Plate 1** below. The identification of Bushfire Prone Areas within any portion of the site requires further assessment of the bushfire hazard implications on proposed development to be undertaken following *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) (WAPC 2015) and the *Guidelines for Planning in Bushfire Prone Areas Version 1.3* (the Guidelines) (WAPC and DFES 2017).

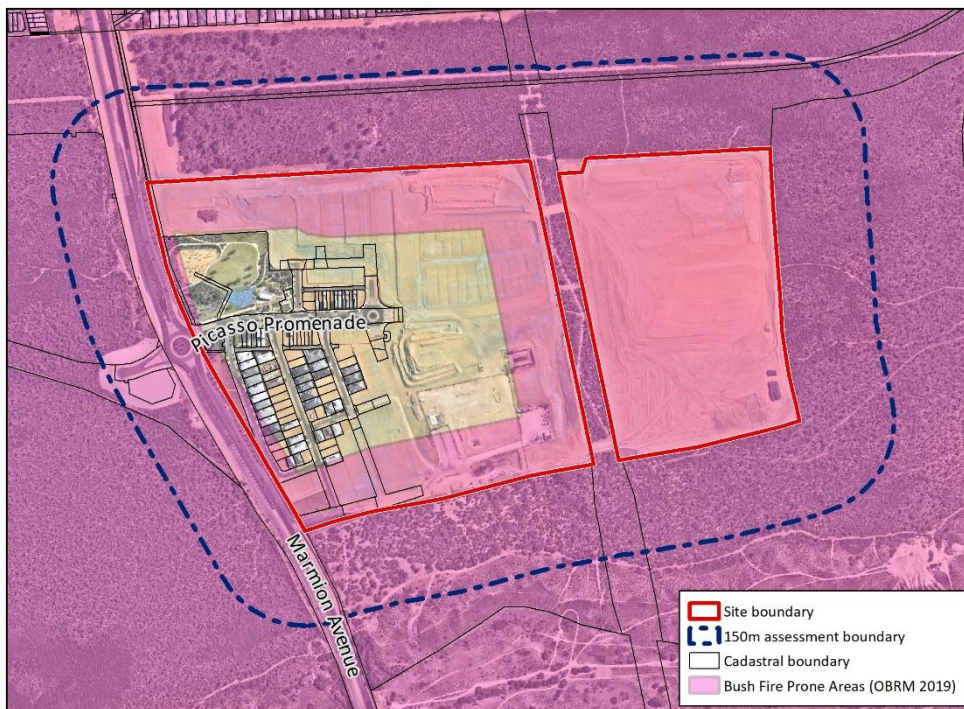


Plate 1: Areas within and surrounding the site identified as “Bushfire Prone Areas” (OBRM 2019).

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



1.1 Aim of this document

The objective of this BMP is to support the future residential development of the site following the Commercial Assessment Plan layout attached in **Appendix A** and to ensure bushfire management issues (such as location, siting, vehicle access and water supply) are addressed as part of the planning and development process. This BMP addresses the requirements of SPP 3.7, the Guidelines and *Australian Standard 3959-2018 Construction of buildings in bushfire-prone areas (AS 3959)* (Standards Australia 2018).

This BMP includes:

- An assessment of classified vegetation and associated bushfire hazard levels in the vicinity of the site (within 150 m) and consideration of hazards that will exist in the post-development scenario.
- Identification of how the development will achieve the performance principles of the Guidelines by ensuring:
 - Development can be located, sited and designed to ensure that any bushfire hazard does not present an unreasonable level of risk to life and property (i.e. BAL-29 is not exceeded), supported by an indicative Bushfire Attack Level (BAL) assessment. Where applicable, this includes consideration of Asset Protection Zone (APZ) requirements.
 - Vehicular access to and egress from the development is safe if a bushfire occurs.
 - Water is available to the development to assist fire suppression so that life and property can be protected from bushfire.
- An outline of the roles and responsibilities associated with implementing this BMP.

1.2 Statutory policy and framework

The following key legislation, policies and guidelines are relevant to the preparation of a bushfire management plan:

- *Bush Fires Act 1954*
- *Fire and Emergency Services Act 1998*
- *Planning and Development Act 2005* and associated regulations
- *Building Act 2011* and associated regulations
- *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (WAPC 2015)
- *Guidelines for Planning in Bushfire Prone Areas version 1.3* (WAPC and DFES 2017)
- *Australian Standard AS 3959:2018 Construction of buildings in bushfire-prone areas* (Standards Australia 2018)

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



1.3 Description of the proposed development

The proposal is for the development of the east and west precincts of the Alkimos Vista subdivision. The site is proposed to be developed for urban purposes following the proposed Masterplan, which provides an outline for how urban development should be progressed for site.

Development within the site will include:

- residential lots;
- an interconnected public road network;
- a railway batter;
- public open space, which includes a mix of passive and active recreation spaces, and;
- a primary school.

This proposed development layout is shown in **Appendix A**.

1.4 Description of the land characteristics

Historical imagery demonstrates that a large portion of the Western Precinct was cleared prior to 1965, then regenerated over the following years until the existing development onsite required the clearance of standing vegetation in 2017. Marmion Avenue was constructed around 2008-2010, with land to the north of the site cleared for development in 2010. The existing clearance of vegetation within the proposed subdivision area occurred in 2019. Land around the subdivision is continuing to be cleared for development, with the rail corridor being cleared in 2020.

The site adjoins regional open space managed by the WAPC which includes a dune system running west to east south of the site. The natural topographic contours (shown in **Figure 1**) indicate there is a depression in the central portion of the site, with the topography rising to the east, south and west. The elevation ranges from 20 m AHD in the western-central portion of the site to 40 m AHD along the eastern boundary. Land to the south is also located at 20 m AHD and rises to the north and south to the dune system

More broadly, the site is located within an area where urban development is currently being progressed and connects with an existing urban road network, and dissected by a rail corridor currently under construction.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



2 Environmental Considerations

In accordance with the *Bushfire Management Plan – BAL Contour* template prepared by the Department of Planning, Lands and Heritage (2018), this BMP has considered whether there are any environmental values that may require specific consideration through either protection, retention or revegetation. To support this, a review of publicly available databases and site-specific investigations has been undertaken, with particular reference to the Shared Location Information Platform (SLIP) databases. A summary of the search results has been provided in **Table 1**.

Table 1: Summary of potential environmental considerations that may be associated with the site (based on a search of the SLIP databases and site-specific information)

Key environmental feature:	Yes / no / potentially occurring within the site	If yes / potentially, describe value that may be impacted
Conservation category wetlands and buffer (Geomorphic wetlands Swan Coastal Plain) (DBCA-019)	No	Not applicable
Waterways (DWER-031)	No	Not applicable
RAMSAR wetlands (DBCA-010)	No	Not applicable.
Threatened and priority flora (DBCA-036)	No	Not applicable.
Threatened and priority fauna (DBCA-037)	• No	Not applicable.
Threatened Ecological Communities (TECs) (DBCA-038)	• No	Not applicable.
Bush Forever areas (DPLH-019)	No	Not applicable.
Clearing regulations – Environmentally Sensitive Areas (ESAs) (DWER-046)	Yes	<ul style="list-style-type: none"> The entire site and surrounding land is mapped as an ESA.
DBCA controlled lands or waters (DBCA-011)	No	<ul style="list-style-type: none"> Not applicable
Swan Bioplan Regionally Significant Natural Areas 2010 (DWER-070)	No	Not applicable
Aboriginal heritage (DPLH-001)	No	Not applicable
Non-indigenous heritage (DPLH-006)	No	Not applicable

Multiple flora and vegetation surveys have been undertaken over the Alkimos – Eglinton district. The most comprehensive survey was a ‘level 2’ survey undertaken in 2005 by ATA Environmental to support the MRS amendment.

Emerge Associates also conducted a flora and vegetation assessment of the Alkimos City Centre and Central LSP areas in October 2012 to verify the previously recorded vegetation association and vegetation condition mapping for the site (Emerge Associates 2013b).

No threatened or priority flora species, priority ecological communities (PECs) or threatened ecological communities (TECs) were recorded during the flora and vegetation surveys.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



2.1 Native vegetation – modification and clearing

The areas for subdivision have been cleared of native vegetation. There has been minor regrowth that will be removed as construction continues.

The proponent owns the land to the north of the subdivision and this area will be developed in the future as part of the overall concept plan. Therefore, a 100 m buffer will be cleared and maintained to the north of the subdivision.

2.2 Revegetation and landscape plans

Landscaping plans for the subdivision have not been finalised at this stage. As future detailed planning occurs (as part of the structure planning and subsequent subdivision process), if any areas are identified for revegetation, any setbacks required from vegetation will be addressed through spatial provisions in the future layout.

The concept for landscaping of public open space is currently to provide low threat vegetation within the majority of POS. Along the southern boundary of Stage 1, the POS will be revegetated to Scrub per the WAPC regional open space.

Management of areas of low threat vegetation in the future should include (but not limited to), and will occur as future development occurs:

- Regular mowing/slashing of grass to less than 100 mm in height (where present).
- Irrigation of grass and garden beds (where required).
- Regular removal of weeds and built up dead material (such as fallen branches, leaf litter etc.).
- Low pruning of trees (branches below 2 m in height removed where appropriate/applicable).
- Application of ground/surface covers such as mulch or non-flammable materials as required/applicable.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



3 Bushfire Assessment Results

Bushfire risk for the site has been appropriately considered in the specific context of the Guidelines and AS 3959. Appendix Two of the Guidelines provides a description for undertaking a broad level of hazard assessment using the vegetation classifications from AS 3959. The purpose is to identify at the strategic level the Bushfire Hazard Level (BHL) and the likely impact and intensity of a bushfire attack.

The objective of AS 3959 is to reduce the risk of ignition and loss of a building to bushfire. It provides a consistent method for determining a radiant heat level (radiant heat flux) as a primary consideration of bushfire attack on a building or object. It measures the Bushfire Attack Level as the radiant heat level (kWm^2) over a distance of 100 m.

It also prescribes simple construction responses that can resist the determined radiant heat level at a given distance from the fire and are based on six Bushfire Attack Level (BAL) ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ. Bushfire risk for the site has been appropriately considered in the specific context of the Guidelines and AS 3959.

Not all vegetation is a classified bushfire risk. Vegetation and ground surfaces that are exempt from classification as a potential hazard are identified as a low threat under Section 2.2.3.2 of AS 3959. Low threat vegetation includes the following:

- a) Any vegetation type that is more than 100 m from the site.
- b) Single areas of vegetation less than 1 ha in area and not within 100 m of other areas of vegetation being classified.
- c) Multiple areas of vegetation less than 0.25 ha in area and not within 20 m of the site or each other or of other areas of vegetation being classified vegetation.
- d) Strips of vegetation less than 20 m wide (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified.
- e) Non-vegetated areas, that is, areas permanently cleared of vegetation, including waterways, exposed beaches, roads, footpaths, buildings and rocky outcrops.
- f) Vegetation regarded as a low threat due to factors such as flammability, moisture content or fuel load. This includes grassland managed in a minimal fuel condition, mangroves and other saline wetlands, maintained lawns, golf courses (such as playing areas and fairways), maintained public reserves and parklands, sporting fields, vineyards, orchards, banana plantations, market gardens (and other non-curing crops), cultivated gardens, commercial nurseries, nature strips and windbreaks.

3.1 Bushfire Hazard Level assessment

To support the proposed scheme amendment, bushfire hazard levels (BHL) within and nearby to the site have been determined in accordance with Appendix Two of the Guidelines and based on the vegetation classification detailed in **Table 2**.

In addition, and to support future development, a method 1 BAL assessment has been completed for the site to understand the BAL ratings likely to be applicable and the associated separation requirements (where applicable), based on the vegetation classification and effective slope detailed in **Table 2**. This is detailed further below.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2

3.1.1 Assessment inputs

Vegetation within the site and surrounding 150 m was classified in accordance with Table 2.3 of AS 3959. The classification of vegetation is based on an assessment of vegetation structure, which considers the various fuel layers of different vegetation types. For example, fuel layers in a typical forest environment can be broken down into five segments as illustrated in **Plate 2** below. These defined fuel layers are considered when determining the classification of vegetation and associated bushfire hazard levels.

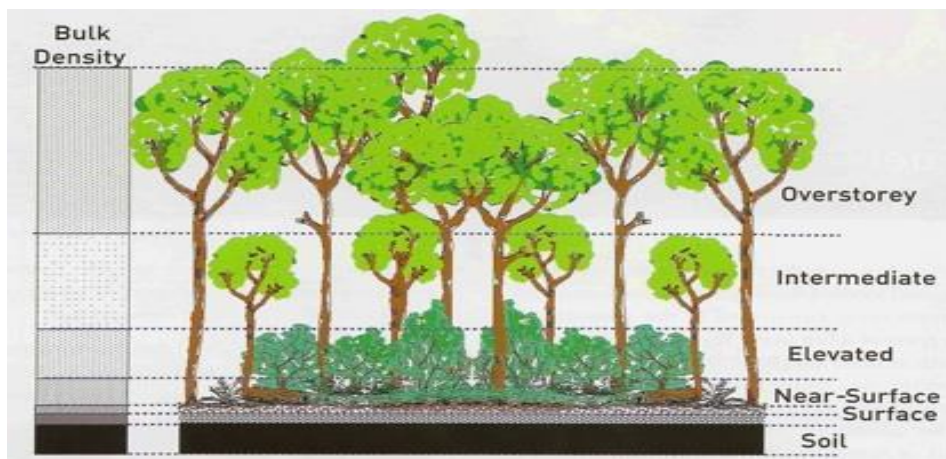


Plate 2: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)

An assessment of existing vegetation within the site and surrounding 150 m was undertaken on 11 May 2020 in accordance with AS 3959 and the Guidelines.

It is noted that not all land within 150 m of the site were accessible due to permission issues, and therefore some areas of vegetation were only visible from publicly accessible roads and/or from lots where permission was granted to access.

Table 2 below outlines:





- The pre-development AS 3959 vegetation classifications (and associated photo locations) are shown in **Figure 2**.
- The pre-development bushfire hazard level ratings are shown in **Figure 3**.
- The post-development AS 3959 vegetation classifications are shown in **Figure 4**.
- The post-development BAL Contour Plan is shown in **Figure 6**.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management





Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
1	<p>AS 3959 classification (Figure 2): Forest (Class A)</p> <p>There is one area of Forest vegetation located to the northwest of the site. This vegetation has an average height of 10 m with a surface, at near surface and elevated fuels.</p>	 <p><i>Photo location 1: View from north of Picasso Park towards vegetation north of existing clearance</i></p>	 <p><i>Photo location 2: View from north of the site towards vegetation north of existing clearance</i></p>	<p>This vegetation will be cleared as a result of the overall concept plan as shown in Appendix A. The proponent is committed to maintaining the vegetation to the north of this subdivision in minimal fuel capacity. Therefore, this will be a temporary hazard.</p> <p>AS 3959 classification (Figure 4): Exclusion 2.2.3.2(f)</p> <p>Effective slope (Figure 5): Not applicable</p>
2	<p>AS 3959 classification (Figure 2): Shrubland (Class C)</p> <p>The Scrub vegetation is bordered to the south by a dune system vegetated with low shrubs under 2 m in height. This vegetation is classified as Shrubland.</p>	 <p><i>Photo location 3: View southern boundary of the site towards the dune system on WAPC land. Scrub in the foreground with Shrubland on dunes.</i></p>	 <p><i>Photo location 4: View from the top of the dunes in WAPC ROS looking north-west over Shrubland</i></p>	<p>This vegetation is located within the WAPC regional open space and will remain in its current state.</p> <p>AS 3959 classification (Figure 4): Shrubland (Class C)</p> <p>Effective slope (Figure 5): Upslope</p>

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)

Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
3	<p>AS 3959 classification (Figure 2): Scrub (Class D)</p> <p>The majority of the vegetation within 150 m of the subdivision is characterised by banksia trees with an average height of 4 m, with all trees under 6 m. The understorey includes native species including grass trees, native grasses and shrubs. This vegetation has a clear surface, near-surface and elevated fuel and is classified as Class D – Scrub.</p>	 <p><i>Photo location 5: View from the southern boundary of the site towards WAPC ROS.</i></p>  <p><i>Photo location 7: View from the southern boundary of the site towards WAPC ROS.</i></p>	 <p><i>Photo location 6: View from the southern boundary of the site towards WAPC ROS.</i></p>  <p><i>Photo location 8: View from the southern boundary of the site towards WAPC ROS.</i></p>	<p>3</p> <p>Scrub to the west, south and east of the subdivision are within the WAPC regional open space and will remain in its current condition.</p> <p>The scrub vegetation to the north will be cleared as part of the overall concept plan and will be a temporary hazard.</p> <p>AS 3959 classification (Figure 4): Scrub (Class D)</p> <p>Effective slope (Figure 5): Upslope (east and west) Downslope 0-5° (south)</p>

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)




Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
	(Continued from above)	 <p>2020/05/11</p> <p><i>Photo location 9: View from the eastern precinct towards Scrub vegetation south-east of the site</i></p>  <p>2020/05/11</p> <p><i>Photo location 10: View from the eastern precinct towards Scrub vegetation east of the site</i></p>  <p>2020/05/11</p> <p><i>Photo location 11: View from the eastern precinct towards Scrub vegetation north of the site</i></p>  <p>2020/05/11</p> <p><i>Photo location 12: View from the western precinct towards Scrub vegetation north of the site</i></p>		<p>(Continued from above)</p> <p>AS 3959 classification (Figure 4): Exclusion 2.2.3.2(f) (Scrub to the north)</p> <p>Effective slope (Figure 5): Not applicable (Scrub to the north)</p>

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)




Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
	(Continued from above)	 <p>Photo location 13: View from the dune system south of the site, looking across Scrub to the cleared Eastern Precinct</p>  <p>Photo location 15: Native vegetation within Picasso Park</p>		(Continued from above) NB: Vegetation within Picasso Park will be maintained with reticulation and separated by more than 20 m from classified vegetation and residential lots.
		 <p>Photo location 14: View from the roundabout west of site looking west over Scrub vegetation</p>		

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)





Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
9	<p>AS 3959 classification (Figure 2): Grassland (Class G)</p> <p>The areas set aside for subdivision into lots has been cleared. However, there is some regrowth of grass and weed species. This vegetation is intermittently maintained and therefore classified as Group G Grassland.</p>	 <p><i>Photo location 16: Grassland vegetation within Western Precinct, in the southern portion</i></p>  <p><i>Photo location 18: Limited regrowth in existing cleared areas onsite in Eastern Precinct</i></p>	 <p><i>Photo location 17: Limited regrowth in existing cleared areas onsite in Western Precinct</i></p>  <p><i>Photo location 19: Grassland vegetation within Eastern Precinct, in the southern portion</i></p>	<p>All Grassland vegetation within the subdivision area will be cleared during construction and maintained in a low threat condition.</p> <p>AS 3959 classification (Figure 4): Exclusion 2.2.3.2(f)</p> <p>Effective slope (Figure 5): Not applicable</p>

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)



Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
10	<p>AS 3959 classification (Figure 2): Exclusion 2.2.3.2(e)</p> <p>Large areas have been cleared within the site for future development.</p> <p>These areas are excluded from vegetation classification.</p>	 <p>Photo location 20: View from the northern extent of cleared land in the Eastern Precinct.</p>  <p>Photo location 22: View from Picasso Park looking east across Western Precinct</p>	 <p>Photo location 21: View from the eastern boundary of the rail corridor looking east</p>  <p>Photo location 23: Developed subdivision within Western Precinct</p>	<p>It is assumed that areas currently identified as non-vegetated will remain so as part of current and proposed land uses. Future development of the site will result in cleared areas being developed as public roads and residential/ public use buildings or areas.</p> <p>AS 3959 classification (Figure 4): Exclusion 2.2.3.2(e)</p> <p>Effective slope (Figure 5): Not applicable</p>

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)




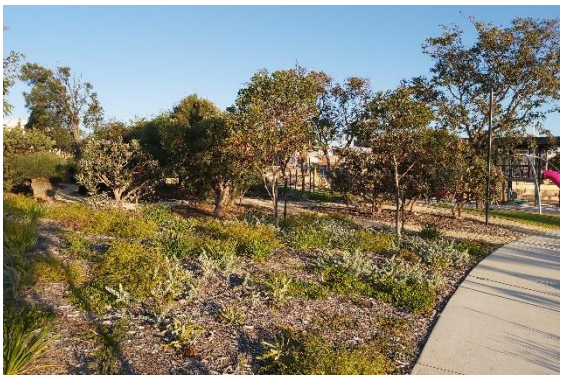
Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
	(Continued from above)	 <p><i>Photo location 24: View from the southern boundary of the Western Precinct looking north-east</i></p>		(Continued from above)
		 <p><i>Photo location 25: View from the eastern extent of the existing subdivision development east over the Western Precinct</i></p>		

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 2: Vegetation classification, effective slope and future management (continued)

Pre development			Post development	
Plot no.	AS 3959 vegetation classification (see Figure 3)	Site photo/s (location points shown in Figure 2)	Plot no.	AS 3959 vegetation classification and effective slope (see Figure 4 and Figure 5)
	<p>AS 3959 classification (Figure 2): Exclusion 2.2.3.2(f)</p> <p>The vegetation within Picasso Park is maintained as public open space with reticulated garden beds, an inundation overflow storm basin, maintained lawns and native planted garden beds. This vegetation is considered a low threat.</p>	 <p><i>Photo location 26: Existing maintained vegetation within along Picasso Promenade</i></p>  <p><i>Photo location 28: View over Picasso Park from north-east corner</i></p>	 <p><i>Photo location 27: Landscaping in inundation area of Picasso Park</i></p>  <p><i>Photo location 29: Native vegetation with reticulation in Picasso Park</i></p>	<p>The majority of the vegetation within Picasso Park will be maintained in its current condition. The vegetation in the inundation overflow will continue to establish but will be maintained and remain a low threat.</p> <p>AS 3959 classification (Figure 4): Exclusion 2.2.3.2(f)</p> <p>Effective slope (Figure 5): Not applicable</p>

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



3.1.1.1 Post-development assumptions

The BAL assessment, to determine the predicated BAL ratings, has assumed the following:

- **Designated FDI:** 80
- **Flame temperature:** 1090 K
- **Vegetation classification:** forest (Class A), scrub (Class D) and grassland (Class G) (see **Figure 4**)
- **Effective slope beneath classified vegetation:** flat/upslope or downslope 0-5° (see **Figure 5**)
- **Setback distances:** as per Table 2.4.3 in AS 3959 with the relevant distances used to inform the BAL contour plan provided in **Figure 6** and summarised in
- Table 3.

In addition to the above, the following key assumptions have informed this assessment:

- All vegetation within the site, except for the vegetation within the POS adjoining the WAPC ROS, will be cleared as part of the development of the site and maintained in a minimal fuel condition in perpetuity (in accordance with the proposed subdivision plan, attached as **Appendix A**).
- POS in the south of the Western Precinct will be revegetated to Scrub.
- Areas of public open space will be formally landscaped (low threat AS 3959 cl.2.2.3.2(f)) and maintained in perpetuity. This will include the provision of turf areas and managed garden beds, picnic/BBQ facilities, pedestrian/cycle network and all age play spaces. The specific design elements will be determined, in consultation with the City as part of implementing the subdivision. Management of this area as a minimum will include:
 - Where remnant trees are retained, these will be low pruned to 2 m from the ground.
 - Regular removal of weeds, dead material, fallen branches and built up leaf litter. This would be based on typical maintenance requirements.
 - Where grass/turf is present, this will be regularly cut so that the grass is maintained at or below 100 mm in height.

These areas will be maintained by the developer initially for at least two years (or as agreed with the City of Wanneroo) and following handover acceptance by the City will be maintained by the City of Wanneroo in a low threat state. Landscape treatments and management are discussed further in **Section 5.1.2**.

- Vegetation within the proponent's landholdings, but outside of the site (or the current stage of development) will be managed to a low threat standard following Section 2.2.3.2 of AS 3959 where this is within 100 m of titled lots. This should be implemented prior to and during the bushfire season (November to May) each year, and may include one or a combination of the below:
 - Removal of all vegetation; or
 - Where remnant trees are retained, these will be low pruned to 2 m from the ground and any understorey species removed.
 - Regular removal of weeds, dead material, fallen branches and built up leaf litter.
 - Where the grass is present, this will be regularly cut so that the grass is maintained at or below 100 mm in height.
- All vegetation within the WAPC ROS will be retained in its current state.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



3.1.2 Assessment outputs

The BAL assessment for the site has been undertaken based on the assumed post-development classified vegetation (see **Figure 4** and **Table 2**) and effective slope (**Figure 5**).

Table 3 provides a summary of the setback distances from the identified classified vegetation necessary to achieve the indicated BAL ratings, with the BAL Contour Plan (**Figure 6**) being a visual representation of these distances. The setback distances are based on the distances outlined in Table 2.4.3 of AS 3959.

Table 3: Setback distances for BAL ratings based on post-development vegetation classifications (Figure 3) and effective slope, as determined by the method 1 BAL assessment and Table 2.4.3 of AS 3959.

Post development plot number (see Figure 4)	Vegetation classification (see Figure 4)	Effective slope (see Figure 5)	Distance to vegetation	BAL Rating (see Figure 6)
2	Shrubland (Class C)	Downslope 10-15°	<9 m	BAL-FZ
			9-<13 m	BAL-40
			13-<19 m	BAL-29
			19-<28 m	BAL-19
			28-<100 m	BAL-12.5
			> 100 m	BAL-LOW
4	Scrub (Class D)	Downslope 0-5°	< 11 m	BAL-FZ
			11 - < 15 m	BAL-40
			15 - < 22 m	BAL-29
			22 - < 31 m	BAL-19
			31 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
3	Scrub (Class D)	Flat/upslope	< 10 m	BAL-FZ
			10 - < 13 m	BAL-40
			13 - < 19 m	BAL-29
			19 - < 27 m	BAL-19
			27 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



4 Identification of bushfire hazard issues

From a bushfire hazard management perspective, the key issues requiring management include:

- Provision of appropriate separation distances from permanent bushfire hazards within and surrounding the site, including areas of Scrub vegetation associated with WAPC ROS, to ensure a BAL rating of BAL-29 or less can be achieved at future built form.
- Potential for a bushfire hazard to arise within the site by inadequate maintenance until development or by the placement of temporary materials. Fuel management will be required within portions of the proponent's landholding that are proposed for future urban development in accordance with the Commercial Assessment Plan, to minimise the impacts of temporary bushfire hazards on dwellings within the site.
- Ensure future public open space is appropriately designed and managed to achieve low threat standards where indicated (see **Figure 4**), in accordance with AS 3959 and the requirements of the City of Wanneroo.
- Uncertainty regarding the timing of subdivision development, and in turn the formation of the secondary access. An interim arrangement is required to ensure the subdivision has two means of access and egress.
- Ensure the provision of appropriate water supply and associated infrastructure for fire-fighting purposes.

These issues are considered further in **Section 5**.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



5 Assessment against the Bushfire Protection Criteria

This BMP provides an outline of the mitigation strategies that will ensure that as development progresses, an acceptable solution and/or performance-based system of control is adopted for each of the bushfire protection criteria detailed within Appendix Four of the Guidelines (WAPC and DFES 2017). The bushfire protection criteria identified in the Guidelines and addressed as part of this BMP are:

- Element 1: Location of the development
- Element 2: Siting and design of the development
- Element 3: Vehicular access
- Element 4: Water supply.

As part of future development, it is likely that an 'acceptable solution' will be able to address the intent of all four bushfire protection criteria as part of future residential development within the site. A summary of how this can be achieved and an associated compliance statement for each has been provided in **Table 3**.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 4: Summary of bushfire protection criteria and compliance statement

Bushfire protection criteria	Intent	Method of compliance	Proposed bushfire management strategies	Compliance Statement
		Acceptable solution		
Element 1: Location	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.	A1.1 Development location	The BAL contour plan (see Figure 6) indicates that future development within the site will be able to achieve a BAL rating of BAL-29 or less.	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 1: Location.
Element 2: Siting and design	To ensure the siting and design of development minimises the level of bushfire impact.	A2.1 Asset Protection Zone	<p>One of the most important bushfire protection measures influencing the safety of people and property is to create an Asset Protection Zone (APZ) around buildings. The APZ is a low fuel area immediately surrounding a building and can include non-flammable features such as irrigated landscapes, gardens, driveways and roads. The APZ is to be managed in accordance with the requirements of 'Standards for Asset Protection Zones'. (see Schedule 1 of the Guidelines).</p> <p>The post-development vegetation classification (Figure 4) identifies permanent bushfire hazards to the east, south and west of the site.</p> <p>Separation from the permanent bushfire risks to the west and east of the site has been accommodated through the strategic placement of public roads and public open space (used for recreation purposes) that will be developed to typical urban standards and will achieve a low-threat standard under AS 2959. Maintenance of these areas will be routine and ongoing, initially by the proponent and then by the City of Wanneroo. This is discussed in Section 5.1.2.</p>	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 2: Siting and design.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance	Proposed bushfire management strategies	Compliance Statement
		Acceptable solution		
Element 3: Vehicular access	To ensure vehicular access serving a subdivision/ development is available and safe during a bushfire event.	A3.1 Two access routes	<p>The proposed subdivision layout, provided in the Commercial Assessment Plan in Appendix A and shown in Figure 4, provides for an interconnected road network which connects to the existing public road network, namely Marmion Avenue to the west of the site. The Western Precinct currently connects to Marmion Avenue. Additional roads will be constructed as part of the subdivision.</p> <p>Safe vehicular access to the site will ultimately be provided through multiple public roads connecting to the north and west of the site, which then connects to the broader public road network. In the interim whilst these roads remain unconstructed, primary access to the site will be provided through a single public road to the north of the eastern precinct, connecting to the Western Precinct as demonstrated in Appendix A. The EAW is required to meet the standards of Table 6 of the Guidelines.</p>	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 3: Vehicular access.
Continued from above.	Continued from above.	A3.2 Public road	All new internal roads can and will comply with the minimum standards outlined in Appendix Four of the Guidelines (WAPC and DFES 2017), which includes a minimum 6 m-wide trafficable surface.	Continued from above.
		A3.3 Cul-de-sac (including dead-end-road)	Not applicable. No cul-de-sacs or dead-end roads are proposed as part of the subdivision of the site. If development is staged, temporary cul-de-sacs may be provided until the broader public road network is fully developed. Where required, they will be provided with suitable turn-around areas for emergency service vehicles.	
		A3.4 Battle-axe	The battle-axe lots are required as there is no vehicle access permitted from the road running along the eastern boundary (due to its road hierarchy classification and also level differences between the lots and the road). The eastern road is currently due to be constructed in 2025 when the adjoining subdivision stages are being constructed. The battle-axe lots must be provided with minimum 6 m access that meets the requirements of Table 6, Column 3 of the Guidelines.	
		A3.5 Private driveway longer than 50 m	Not applicable. No private driveways longer than 50 m are proposed based on the density of residential development.	

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance	Proposed bushfire management strategies	Compliance Statement
		Acceptable solution		
		A3.6 Emergency access way	<p>The site will require a temporary emergency access way in order to provide connection from the eastern precinct to the western precinct. The emergency access way will be constructed by the proponent to support the first stage of development and will be maintained until at least two permanent egress routes are implemented as part of the Masterplan, connecting the site to the existing broader public road network.</p> <p>The emergency access way will be constructed to meet the minimum requirements outlined in the Guidelines to allow access for fire emergency services and to the public during an emergency, including:</p> <ul style="list-style-type: none"> • Provision of an easement in gross to ensure accessibility to the public and emergency services during an emergency. • Be no longer than 600 m (the current conceptual design has a length of 485 m). • Be adequately signposted where it joins the public road network. • Provision of access gates to control traffic flow during non-emergency periods <p>Comply with the minimum standards for a public road outlined in the Guidelines, including a sealed surface.</p>	

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Table 4: Summary of bushfire protection criteria and compliance statement (continued)

Bushfire protection criteria	Intent	Method of compliance	Proposed bushfire management strategies	Compliance Statement
		Acceptable solution		
Continued from above.	Continued from above.	A3.7 Fire service access routes (perimeter roads)	Future development within the site will be provided with appropriate vehicular access, as outlined above, and therefore fire service routes are unlikely to be required.	Continued from above.
		A3.8 Firebreak width	Until residential development is progressed in accordance with the proposed subdivision plan the proponent will maintain the existing firebreaks within the property boundary which are a minimum 3 m-wide, as per the requirements of the City of Wanneroo Fire Notice.	
Element 4: Water	To ensure water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	A4.1 Reticulated areas	<p>Development is located within an Emergency Services Levy (ESL) Category 3 area, which is likely to change to a Category 1 area once as part of subdivision approval. The existing subdivision within the site has changed from Category 3 to Category 1 as a result of development.</p> <p>The site will connect with a reticulated water supply and will include fire hydrants installed by the developer to meet the specifications of Water Corporation (Design Standard DS 63) and DFES. Fire hydrants on land zoned for residential purposes are required to be sited at or within 200 m of residential dwellings (Class 1a).</p> <p>The Water Corporation will be responsible for all hydrant maintenance and repairs.</p>	Based on the outlined management measures, future development would be able to comply with and meet the intent of Element 4: Water

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



5.1 Additional management strategies

5.1.1 Future approval considerations

Confirmation and certification of the BAL Contour Map (**Figure 6**) will be required prior to the issuing of titles, as a condition of subdivision approval. Specifically, model subdivision condition F7 is anticipated to be applied to any future subdivision approval, which states:

A compliance certificate/report for the BAL Contour Map relating to the approved subdivision shall be completed prior to the issuing of titles to the satisfaction of the Western Australian Planning Commission. (Local Government)

These BAL compliance certificate/reports will include a table specifying final lot numbers, assigned BAL ratings and separation distance/s to applicable bushfire hazards. Any required in-lot setbacks and associated APZs will also be specified, if applicable.

Following the creation of the lot titles, a building license will be required to construct a dwelling. This BMP and any future BAL compliance certificate/reports will inform the construction requirements for future dwellings. As no future dwellings are likely to exceed BAL-29, additional planning or development approval will not be required to address bushfire considerations.

5.1.2 Landscape management

1.1.1.1 Within the site

It is expected and assumed that the proposed subdivision and development of the site will result in the removal of all classified vegetation within the site. However, vegetation within the POS along the southern boundary of the Western Precinct, which will be retained and assumed to be revegetated. The revegetation specification will be determined through the detailed design process, however, a 'Scrub' classification with no ongoing fuel management has been assumed to represent a worst-case scenario. On this basis, future revegetation works will not increase the risk of bushfire compared to that assessed in this BMP.

The proposed landscape treatments and management measures to be implemented within various portions of the site (including POS areas, the revegetation wetland buffer and the proposed primary school site) are yet to be determined.

Clearing/management of this vegetation will be undertaken by the proponent, either in accordance with an approved Clearing Permit issued under the *Environmental Protection Act 1986* or under an exemption from a Clearing Permit through future subdivision approvals issued for this area under the *Planning and Development Act 2005*.

The vegetation to the north of the subdivision is owned by the proponent who will clear and maintain a 100 m buffer in a minimal fuel condition until the balance of the Master Plan is constructed, removing the threat.

Any hazard management should be implemented prior to and during the bushfire season (November to May) each year, and may include one or a combination of the below:

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



- Removal of all vegetation; or
- Where remnant trees are retained, these will be low pruned to 2 m from the ground and any understorey species removed.
- Regular removal of weeds, dead material, fallen branches and built up leaf litter.
- Where the grass is present, this will be regularly cut so that the grass is maintained at or below 100 mm in height.

POS Areas

All POS areas within the site (with the exception of the southern POS in the Western precinct), as shown in **Appendix A**, will be landscaped as a low threat (AS 3959 cl.2.2.3.2(f)) and actively managed to support recreational uses. Landscape plans will be prepared by the proponent for all POS areas and will be subject to approval by the City of Wanneroo as a condition of subdivision approval. Specifically, model subdivision condition R4 is anticipated to be applied to any future subdivision approval, which states:

Arrangements being made for the proposed public open space to be developed by the landowner/ applicant to a minimum standard and maintained for two summers through the implementation of an approved landscape plan providing for the development and maintenance of the proposed public open space in accordance with the requirements of Liveable Neighbourhoods and to the specifications of the local government. (Local Government)

The proponent is committed to the detailed landscape designs achieving a low threat vegetation standard in POS areas, in accordance with AS 3959. It is anticipated that this will include landscape design features such as turf and managed garden beds, retained or individual mature trees, picnic/BBQ facilities, a pedestrian/cycle network and all-ages play spaces.

The maintenance of these POS areas will be the responsibility of the proponent during the initial establishment period (typically two years), following which the long-term maintenance responsibilities will transfer to the City of Wanneroo following handover. These maintenance works will ensure the low threat standard of POS areas is maintained.

The proponent is committed to achieving a low threat vegetation standard within these areas of POS. Notwithstanding this, the City of Wanneroo will maintain control of the landscaping process through the future subdivision approval issued under the *Planning and Development Act 2005*, given they will be the clearing authority for the associated subdivision approval condition, which provides a statutory mechanism for the City to ensure a low threat vegetation standard is achieved within future POS areas.

In addition, prior to handover to the City, Section 33 of the *Bushfire Act 1954* provides a statutory mechanism for the Minister or local government to enforce on a private landholder or state agency a requirement to maintain land such as not to be conducive to the outbreak of a bushfire or the spread or extension of a bushfire. As such, this provides another statutory mechanism that could be enacted by the City (if required) against the proponent to ensure that POS areas are/continue to be maintained to a low threat vegetation classification under AS 3959.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



Primary school lot

The area designated for the primary school has been cleared. Management of the primary school site will be the responsibility of the proponent whilst they maintain ownership of the land. Once the land is ceded to the Department of Education, they will be responsible for its ongoing management. As outlined above, the City has additional statutory mechanisms to enforce landowners to maintain their land to suitable low fuel conditions under Section 33 of the *Bushfires Act 1954*, if required.

5.1.2.1 Surrounding the site

Private landholdings surrounding the site are assumed to be managed by the applicable landowners in accordance with the relevant Firebreak Notices, in perpetuity.

WAPC ROS

The WAPC managed ROS will remain in its current condition, presenting the greatest risk from potential bushfire.

5.1.3 City of Wanneroo Fire Notice

The City of Wanneroo releases a Firebreak Notice on an annual basis to provide a framework for bushfire management within the City. The City is able to enforce this notice in accordance with Section 33 of the *Bush Fires Act 1954*.

Until the subdivision is progressed within the site, the proponent will be required to comply with the Firebreak Notice, including the maintenance of minimum 3 m-wide perimeter firebreaks (or as agreed with the City).

All landowners of future lots will be required to comply with the Firebreak Notice as published, which for residential lots is likely to include ensuring that the property is cleared of all flammable material, except for living standing trees, and ensuring that grass height is no longer than 4 cm. This will be detailed within the annual Firebreak Notice.

5.1.4 Vulnerable or high-risk land uses

A primary school is proposed within the southern portion of the site, which is identified as a vulnerable land use based on the definitions of SPP 3.7 and the Guidelines.

Policy measure 6.6 of SPP 3.7 requires any proposal relating to a vulnerable land use subject to a BAL rating of BAL-12.5 or greater, to address the applicable policy provisions, and at the development application stage, this may include the preparation of a bushfire management plan and an emergency evacuation plan.

The primary school is located in the southern portion of the site (see **Appendix A**) and will be able to construct all buildings within the area subject to a BAL rating of BAL-LOW. Accordingly, policy measure 6.6 will not apply to the site.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



5.1.5 Public education and preparedness

Community bushfire safety is a shared responsibility between individuals, the community, government and fire agencies. DFES has an extensive Community Bushfire Education Program including a range of publications, a website and Bushfire Ready Groups. The DFES publication '*Prepare. Act. Survive.*' (DFES 2014) provides excellent advice on preparing for and surviving the bushfire season. Other downloadable brochures are available from <http://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/pages/publications.aspx>

The City of Wanneroo provides bushfire safety advice to residents available from their website https://www.wanneroo.wa.gov.au/downloads/download/384/fire_information. Professional, qualified consultants also offer bushfire safety advice and relevant services to residents and businesses in high-risk areas in addition that that provided in this BMP.

Future residents of the site are able to access additional bushfire information via the above sources, or through contacting the City of Wanneroo or DFES directly. In the case of a bushfire in the area, advice would be provided to residents by DFES, Department of Biodiversity, Conservation and Attractions and/or the City of Wanneroo on any specific recommendations to responding to the bushfire, including evacuation if required. It is recommended that future residents should make themselves aware of their responsibilities with regard to preparing for and responding to a potential bushfire that may impact them, their family/dependents and their property (regardless of the applicable BAL rating).

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



6 Responsibilities for Implementation and Management of Bushfire Measures

Table 5 outlines the future responsibilities of the landowner/developer and the City of Wanneroo associated with implementing this BMP with reference to ongoing bushfire risk mitigation measures for existing land uses (through compliance with the *City of Wanneroo Firebreak Notice*) or future mitigation measures to be accommodated as part of the future structure planning process. These responsibilities will need to be considered as part of the subsequent development and implementation process.

Table 5: Responsibilities for the implementation of the BMP

Management action	Timing
Developer	
Provide temporary emergency access from the eastern precinct to the western precinct until the final road network is completed.	Until final road network is constructed.
Certify BAL ratings for the lots, at the time lot titles are created, based on the BAL Contour Plan (Error! Reference source not found.) and/or in accordance with a revised BAL assessment if the vegetation classifications are different. The certified BAL ratings can then be submitted to the City of Wanneroo to support future building licenses.	To support clearance of new lot titles
Identify building envelopes on the title that provide for the alignment of the envelopes and APZs between the two lots.	To support clearance of new lot titles
On each lot, a Section 165 (<i>Planning and Development Act 2005</i>) Notification is to be placed on the Certificate of Title, to inform the purchaser and any successor, of the existence of the overarching BMP.	To support clearance of new lot titles
Covenant each lot (s. 129 Transfer Land Act 1893) to provide that canopy cover shall not exceed 10% across the Lot.	To support the creation of lot titles
Maintain vegetation located within 100 m of the subdivision application area, within the developer's landholding to a low threat standard to reduce bushfire hazard to future titled lots	To support the creation of lot titles
Property owner/occupier	
Ensuring construction of dwelling/s complies with AS 3959 -2009 where a BAL rating greater than BAL-LOW is applicable, as detailed within the certified BAL assessment that will be completed prior to the creation of lot titles.	As part of building design and construction
City of Wanneroo	
Monitoring vegetation fuel loads in private landholdings and against the requirements of the City's Firebreak Notice and Section 33 1(b) of the <i>Bush Fires Act 1954</i> .	Ongoing, as required
Maintain all areas of developed POS under their management to a low threat standard in accordance with Section 2.2.3.2 of AS 3959, to ensure adjoining residential lots are not subject to a BAL above BAL Low.	Ongoing, as required.
Maintaining public road reserves under their management to appropriate standards, where required/applicable.	Ongoing, as required.
Water Corporation	
The Water Corporation is responsible for the ongoing maintenance and repair of hydrants.	Ongoing, as required.

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



7 Applicant Declaration

7.1 Accreditation

This BMP has been prepared by Emerge Associates who have been providing bushfire risk management advice for more than six years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry.

Anthony Rowe is a Fire Protection Association of Australia (FPAA) Level 3 Bushfire Planning and Design (BPAD) accredited practitioner (BPAD no. 36690) with over ten years' experience and is supported by a number of team members who have undertaken BPAD Level 1 and Level 2 training and are in the processing of gaining formal accreditation.

7.2 Declaration

I declare that the information provided is true and correct to the best of my knowledge.

Signature:

A handwritten signature in black ink, appearing to read "Anthony Rowe".

Name: Anthony Rowe

Company: Emerge Associates

Date: 19-06-2020

BPAD Accreditation: BPAD no. 36690

Bushfire Management Plan

Alkimos Vista Subdivision Stages 1 and 2



8 References

8.1 General references

The references listed below have been considered as part of preparing this document.

Department of Fire and Emergency Services (DFES) 2014, *Prepare. Act. Survive.*, Perth. August 2014.

Gould, J., McCaw, W., Cheney, N., Ellis, P. and Matthews, S. 2007, *Field Guide: Fuel Assessment and Fire Behaviour Prediction in Dry Eucalypt Forest*, CSIRO and Department of Environment and Conservation, Perth, Western Australia.

Standards Australia 2018, *AS 3959-2018 Construction of buildings in bushfire-prone areas*, Sydney.

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

Western Australian Planning Commission and Department of Fire and Emergency Services (WAPC and DFES) 2017, *Guidelines for Planning in Bushfire Prone Areas Version 1.3*, Western Australia. December 2017.

8.2 Online references

Landgate 2020, *Locate V5*, viewed May 2020, <https://maps.slip.wa.gov.au/landgate/locate/>

Landgate 2020, *Map Viewer*, viewed May 2020, <https://www0.landgate.wa.gov.au/maps-and-imagery/interactive-maps/map-viewer>

Office of Bushfire Risk Management (OBRM) 2019, *Map of Bush Fire Prone Areas*, viewed May 2020, <https://maps.slip.wa.gov.au/landgate/bushfireprone/>

Figures



Figure 1: Site Location and Topographic Contours

Figure 2: Existing Conditions - AS 3959 Vegetation Classifications

Figure 3: Pre-Development Site Conditions - Bushfire Hazard Level

Figure 4: Post Development Site Conditions – AS 3959 Vegetation Classifications

Figure 5: Post Development Site Conditions – Effective Slope

Figure 6: Post Development Site Conditions – Bushfire Attack Level Contours

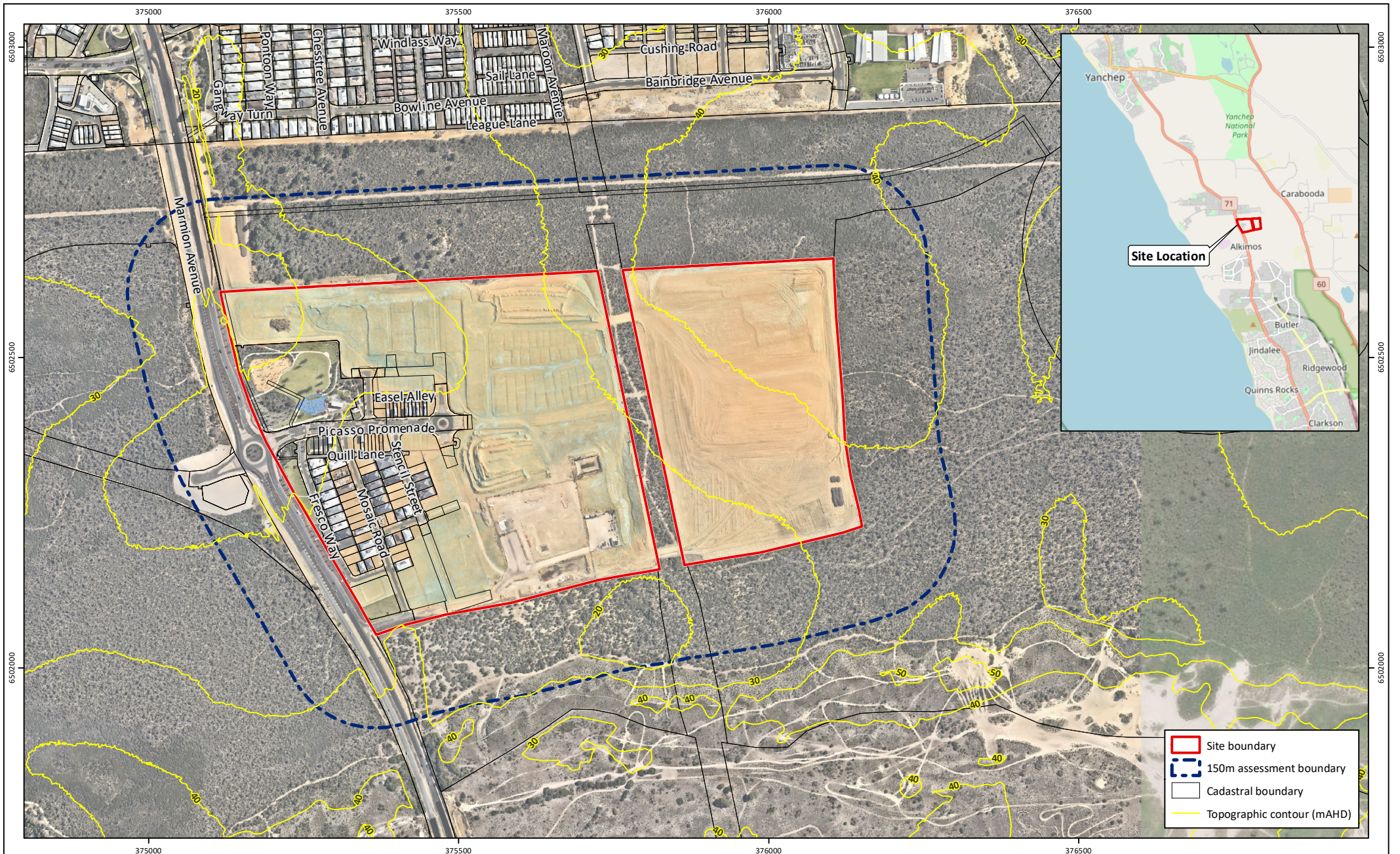
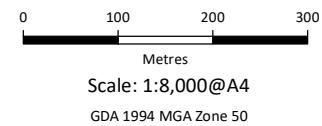


Figure 1: Site Location and Topography

Project: Bushfire Management Plan
 Alkimos Vista Subdivision - Stage 1 and 2
Client: Lendlease Communities (Alkimos Central) Pty Ltd

Plan Number:
 EP17-001(18)-F34
Drawn: GAR
Date: 14/05/2020
Checked: DAE
Approved: AJR
Date: 19/06/2020



While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used

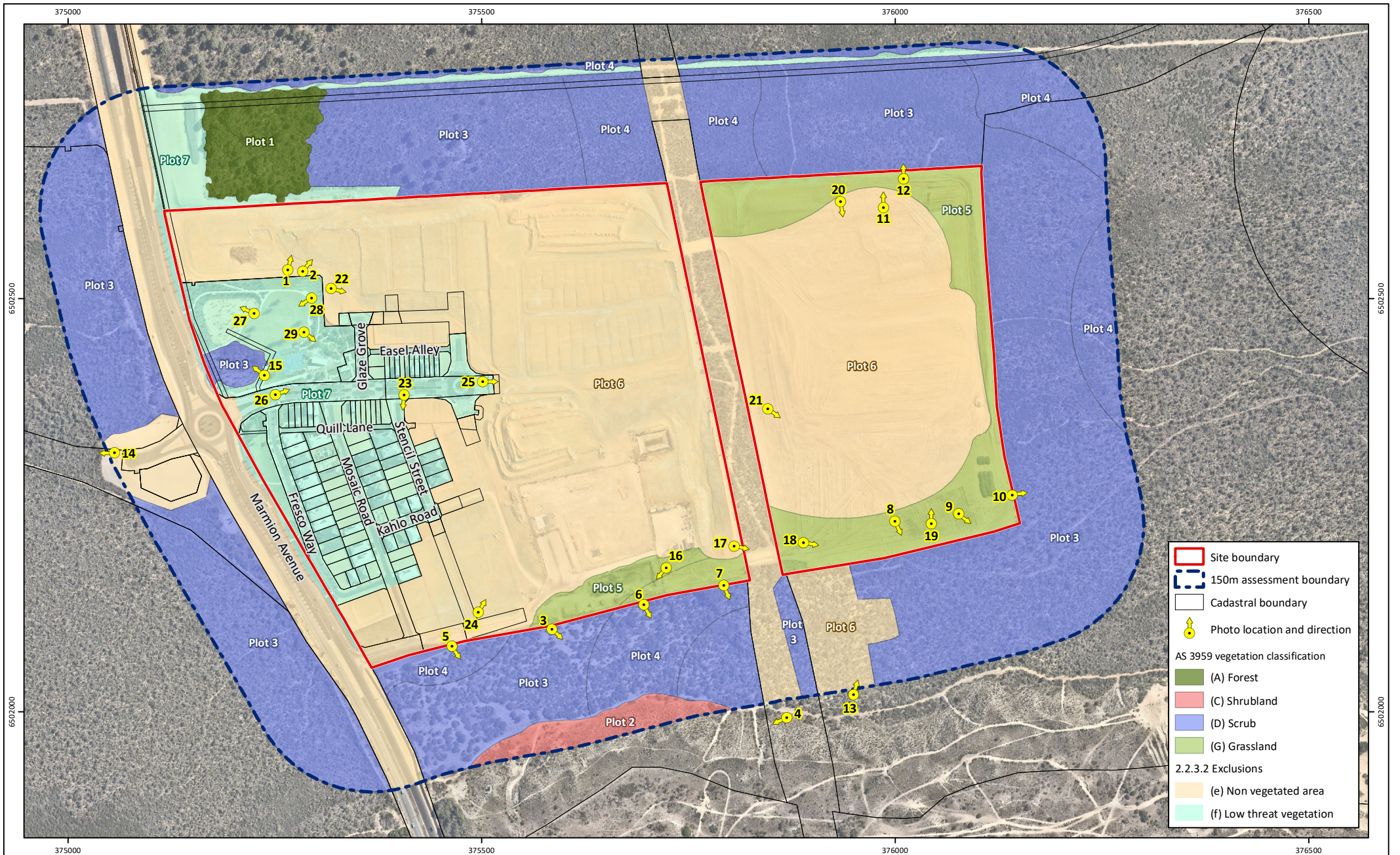
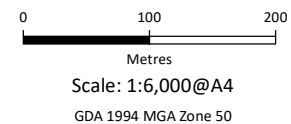


Figure 2: Pre-Development Site Conditions - AS3959 Vegetation Classification

Project: Bushfire Management Plan
 Alkimos Vista Subdivision - Stage 1 and 2
Client: Lendlease Communities (Alkimos Central) Pty Ltd

Plan Number:
 EP17-001(18)-F35
Drawn: GAR
Date: 14/05/2020
Checked: DAE
Approved: AJR
Date: 19/06/2020



While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used

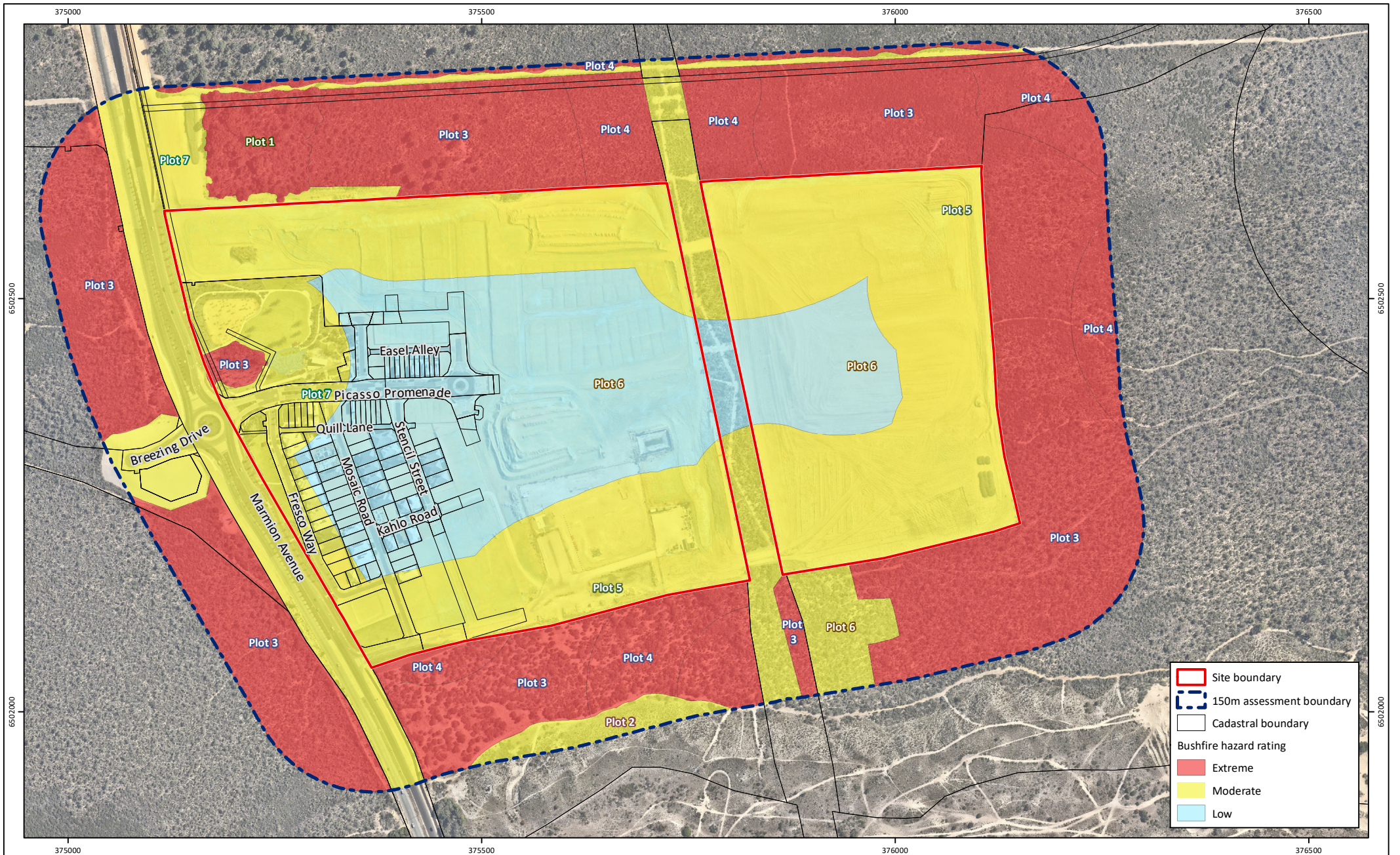


Figure 3: Pre-Development Site Conditions - Bushfire Hazard Level

Project: Bushfire Management Plan
 Alkimos Vista Subdivision - Stage 1 and 2
Client: Lendlease Communities (Alkimos Central) Pty Ltd

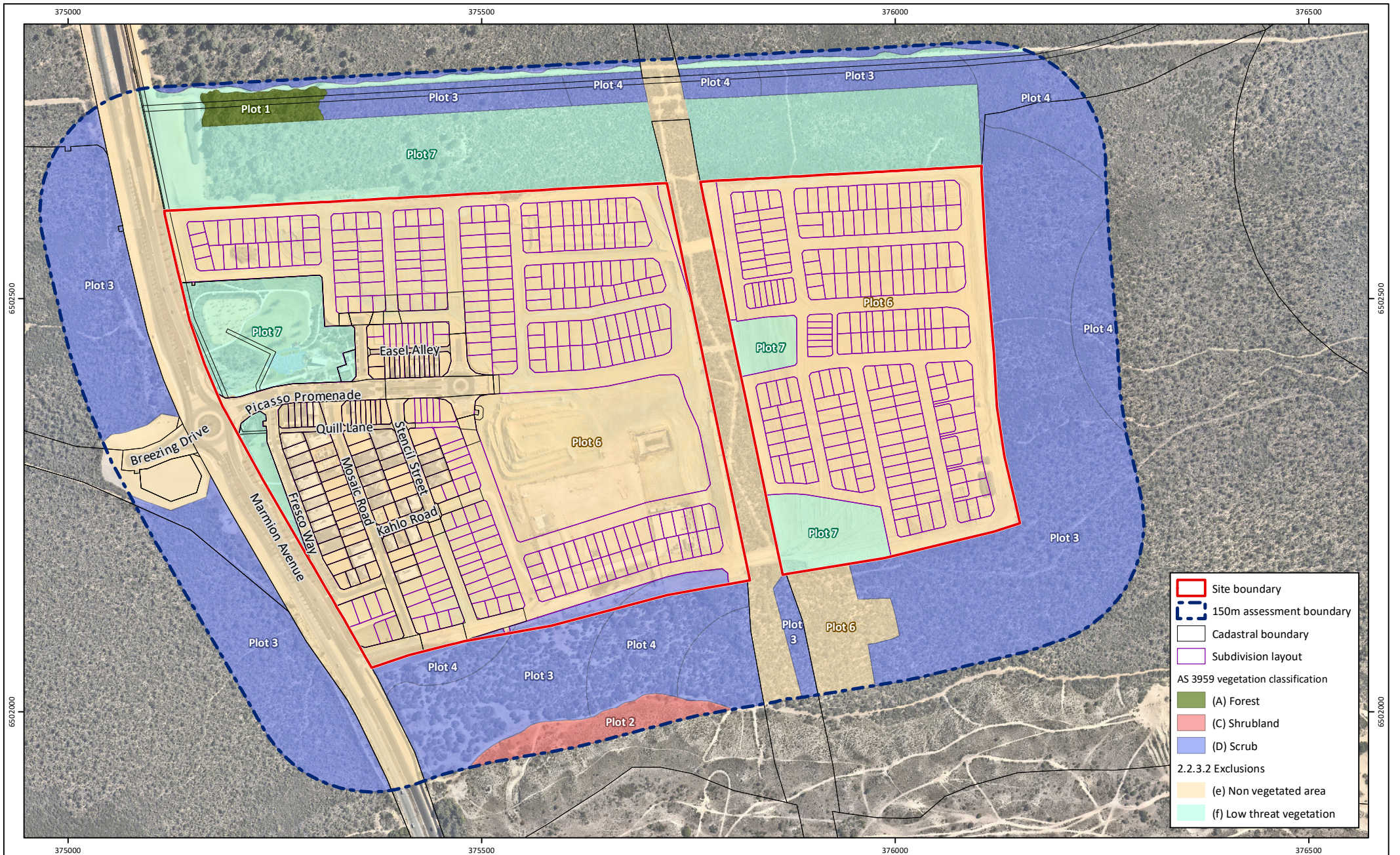
Plan Number:
 EP17-001(18)-F36
Drawn: GAR
Date: 14/05/2020
Checked: DAE
Approved: AJR
Date: 19/06/2020



0 100 200
 Metres
 Scale: 1:6,000@A4
 GDA 1994 MGA Zone 50



While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used



Site boundary
 150m assessment boundary
 Cadastral boundary
 Subdivision layout
 AS 3959 vegetation classification
 (A) Forest
 (C) Shrubland
 (D) Scrub
 2.2.3.2 Exclusions
 (e) Non vegetated area
 (f) Low threat vegetation

Figure 4: Post Development Site Conditions - AS3959 Vegetation Classification

Project: Bushfire Management Plan
Alkimos Vista Subdivision - Stage 1 and 2


Client: Lendlease Communities (Alkimos Central) Pty Ltd

Plan Number:
EP17-001(18)-F37

Drawn: GAR
Date: 14/05/2020

Checked: DAE
Approved: AJR
Date: 19/06/2020

N



0 100 200
Metres

Scale: 1:6,000@A4
GDA 1994 MGA Zone 50



While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used

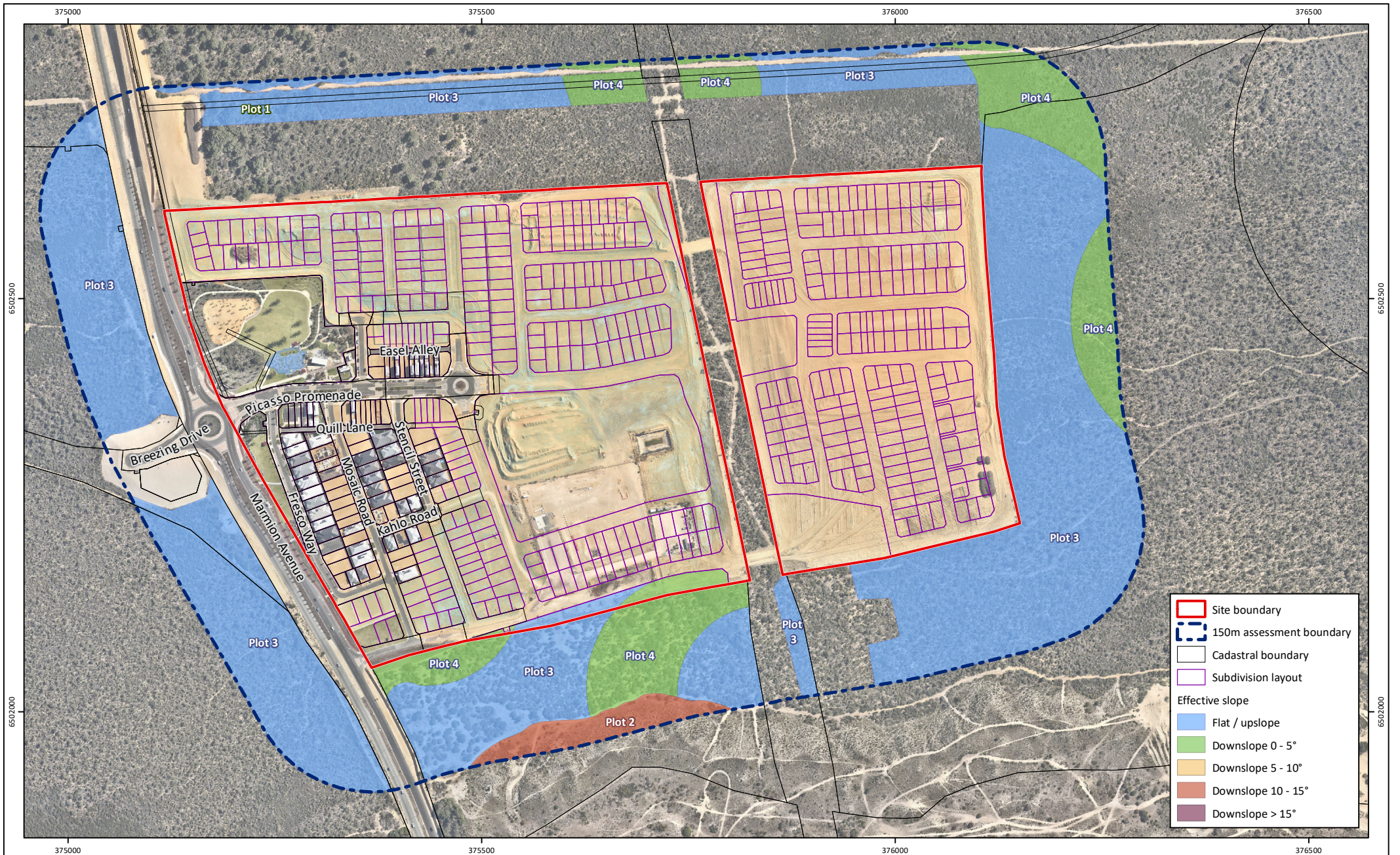


Figure 5: Post Development Site Conditions - Effective Slope

Project: Bushfire Management Plan
 Alkimos Vista Subdivision - Stage 1 and 2
Client: Lendlease Communities (Alkimos Central) Pty Ltd

Plan Number:
 EP17-001(18)-F38
Drawn: GAR
Date: 14/05/2020
Checked: DAE
Approved: AJR
Date: 19/06/2020



0 100 200
 Metres
 Scale: 1:6,000@A4
 GDA 1994 MGA Zone 50



While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used

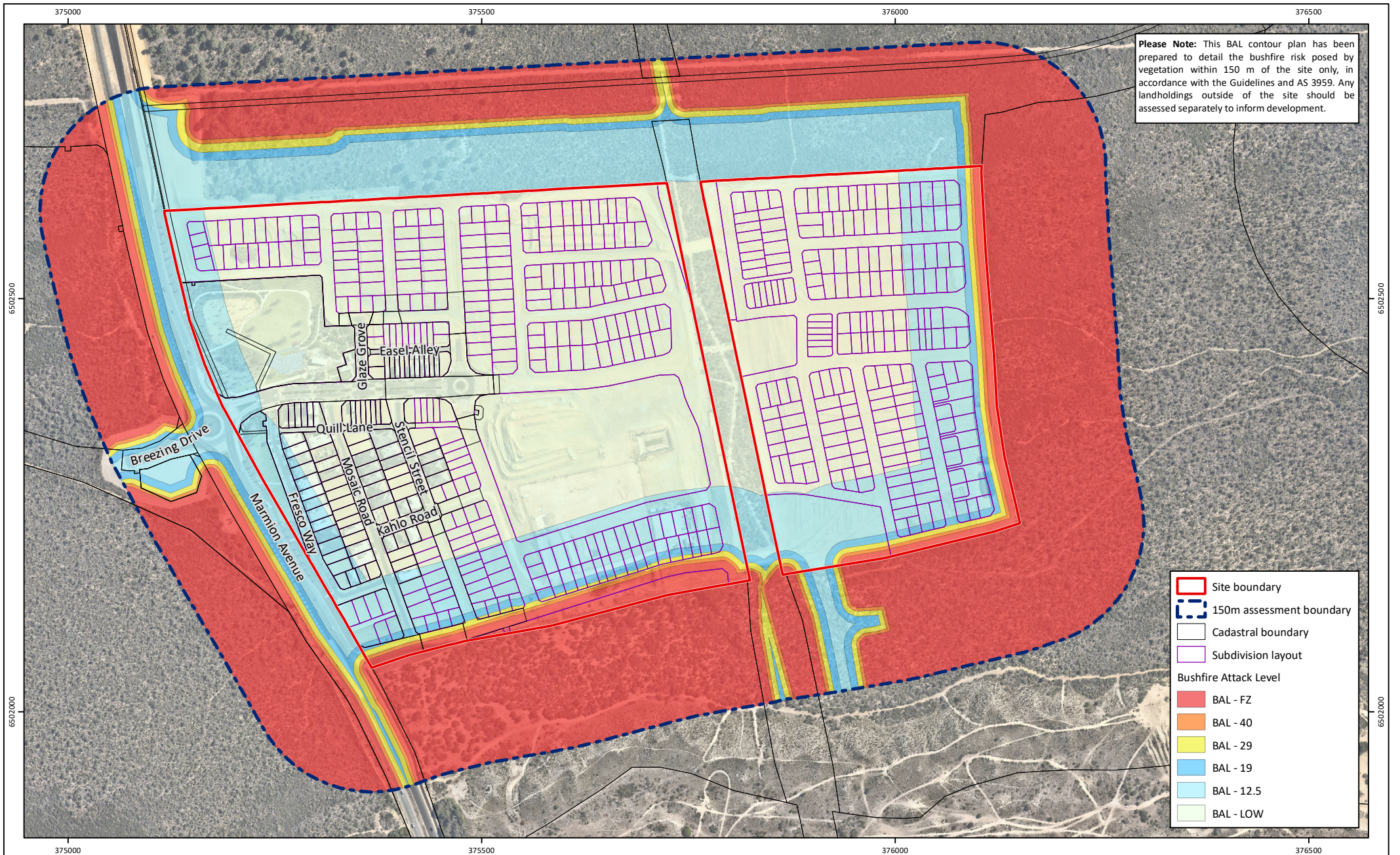
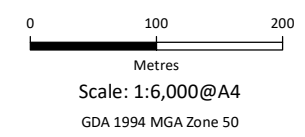


Figure 6: Bushfire Attack Level Contour Plan

Project: Bushfire Management Plan
 Alkimos Vista Subdivision - Stage 1 and 2
Client: Lendlease Communities (Alkimos Central) Pty Ltd

Plan Number:
 EP17-001(18)-F39
Drawn: GAR
Date: 14/05/2020
Checked: DAE
Approved: AJR
Date: 19/06/2020

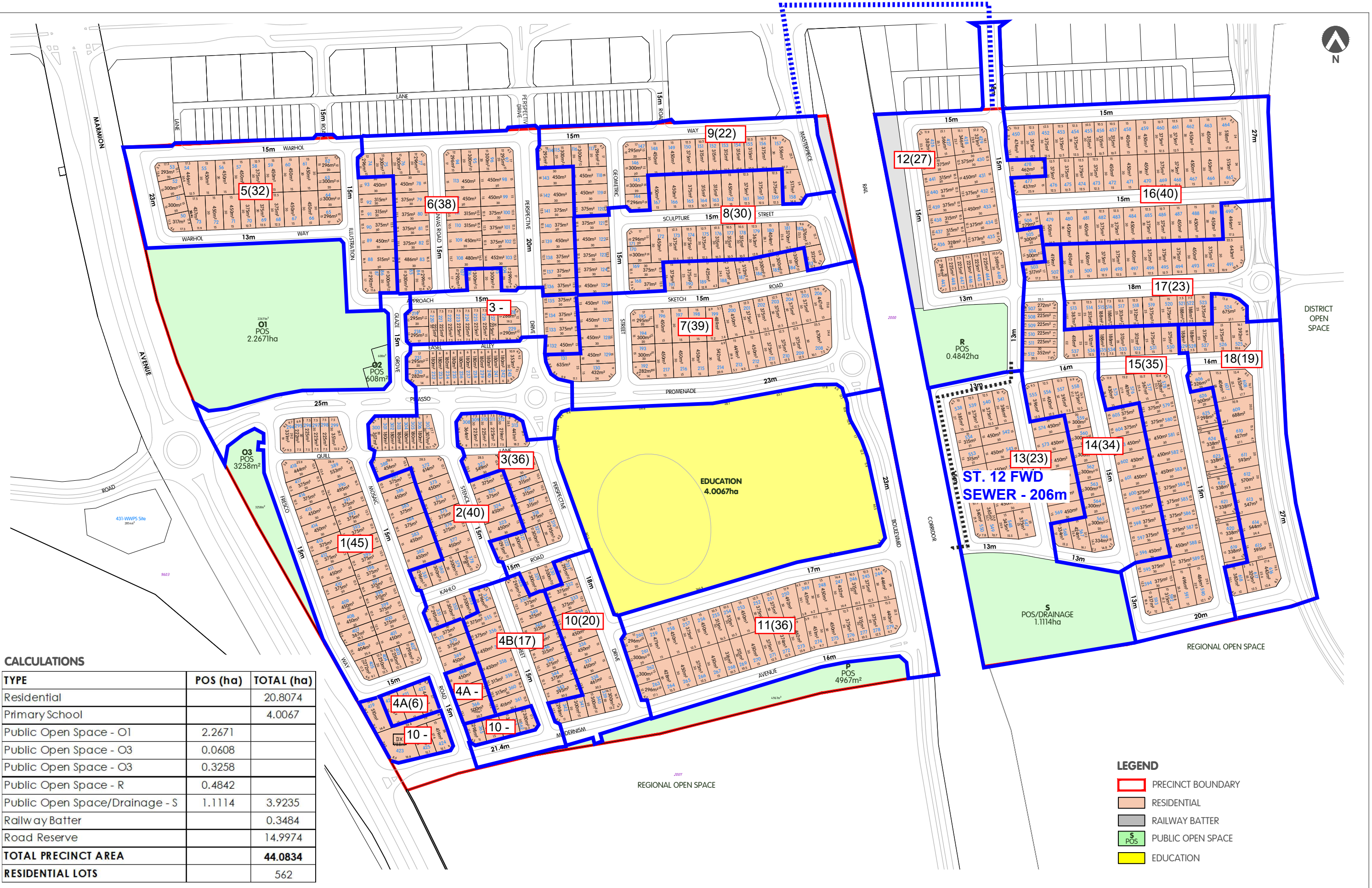


While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used

Appendix A

Commercial Assessment Plan





CALCULATIONS

TYPE	POS (ha)	TOTAL (ha)
Residential		20.8074
Primary School		4.0067
Public Open Space - O1	2.2671	
Public Open Space - O3	0.0608	
Public Open Space - O3	0.3258	
Public Open Space - R	0.4842	
Public Open Space/Drainage - S	1.1114	3.9235
Railway Batter		0.3484
Road Reserve		14.9974
TOTAL PRECINCT AREA		44.0834
RESIDENTIAL LOTS		562

LEGEND

- PRECINCT BOUNDARY
- RESIDENTIAL
- RAILWAY BATTER
- PUBLIC OPEN SPACE
- EDUCATION



CADASTRAL INFORMATION
 SOURCE: VERIS
 YYMMDD: 180416
 DWG REF: 21709-003-R0.dwg
 PROJECTION: PCG94

AERIAL PHOTOGRAPHY
 SOURCE: NA
 YYMMDD: NA



COMMERCIAL ASSESSMENT PLAN (APRIL 2020) (NORTHERN LOTS EXCLUDED)

E	UPDATE VISTA EAST RD1 152D	200424	SB	DRAFT
D	YR MODIFIED IN TITLE	190909	SB	RD
C	REMOVE NTHN LOTS	181012	SB	RD
B	PRECINCT 1 BOUNDARY MOD	180911	SB	RD
A	BASE DLL CEN RD1 043F	180911	SB	-
REV	DESCRIPTION	YYMMDD	DRAWN	APPRD

REF NO.	DLL CEN	DRAW NO.	RD1 102	REV.	E
---------	---------	----------	---------	------	---

Alkimos Vista
City of Wanneroo

DISCLAIMER: ISSUED FOR DESIGN INTENT ONLY. ALL AREAS AND DIMENSIONS ARE SUBJECT TO DETAIL DESIGN AND SURVEY

