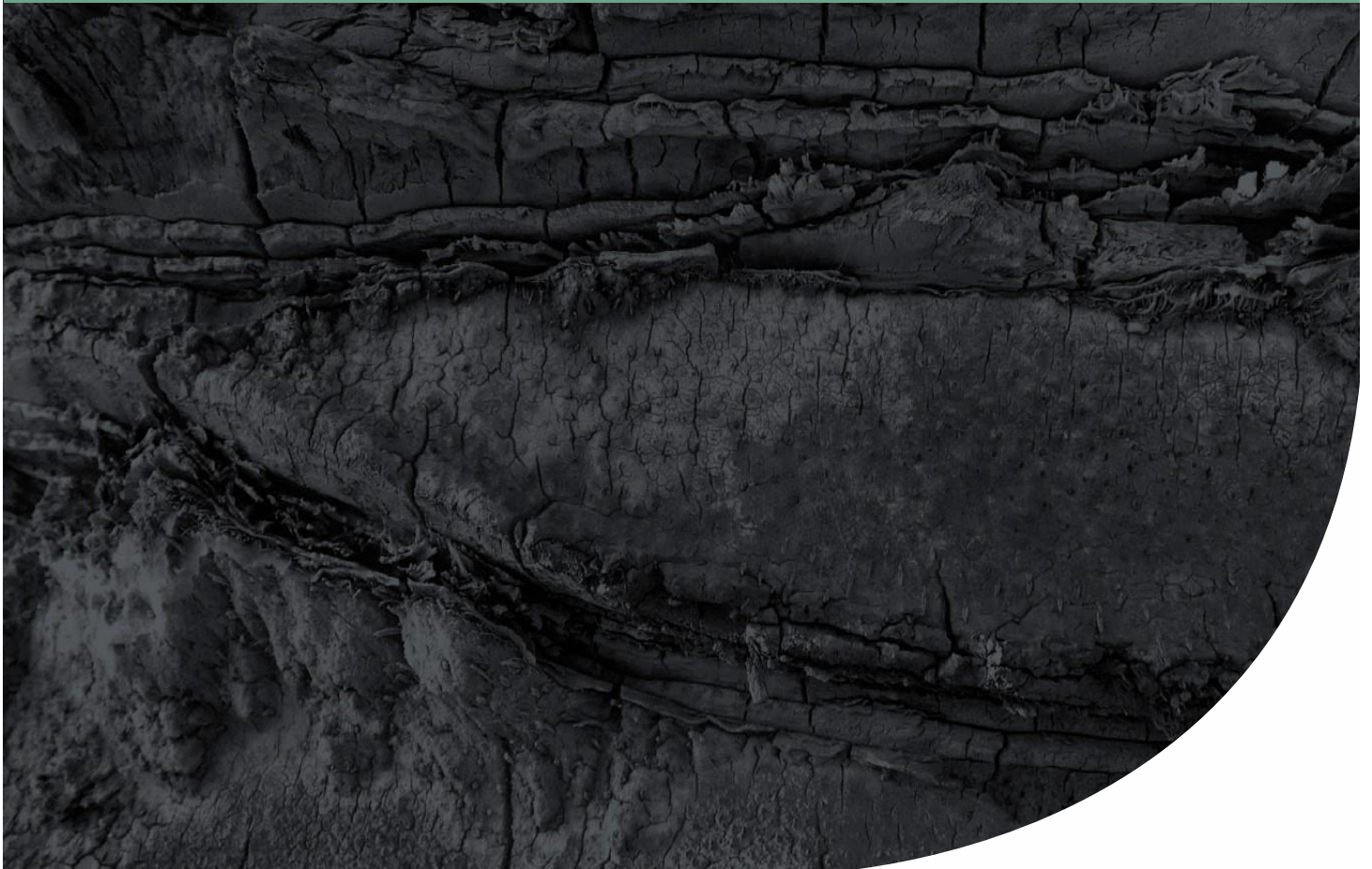


Bushfire Management Plan

Portion 9009 Mandurah Road, Lakelands

Project No: EP15-019(47)

**Prepared for Satterley Property Group
May 2024**



Bushfire Management Plan

Portion 9009 Mandurah Road, Lakelands



Document Control

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Submitted to the client for review					

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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" (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 threatened by the effects of bushfire attack.

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Portion 9009 Mandurah Road, Lakelands



Executive Summary

Satterley Property Group (the proponent) are proposing to subdivide a portion of Lot 9009 Mandurah Road, Lakelands (herein referred to as 'the site') for residential purposes, which comprises stages 13, 16 and 17 of Ocean Hill Private Estate.

The site is 17 hectares (ha) in area and is located within the City of Mandurah. It is bounded by Mandurah Road to the west, Bush Forever Site 395 (Rockingham Lake Regional Reserve) to the north, residential development to the south, and undeveloped land proposed for residential development (which is also within the broader Lot 9009 landholding) to the east.

The site is zoned 'Urban' under the Metropolitan Region Scheme and 'Urban Development' under the City of Mandurah Local Planning Scheme No. 12. It is found within the Lakelands North Ocean Hill Structure Plan and the proposed development is consistent with the zoning of the land and the approved structure plan.

The site is located within a 'bushfire prone area' under the state-wide *Map of Bush Fire Prone Areas* prepared by the Office of Bushfire Risk Management (OBRM 2021). The identification of a site within an area declared as bushfire prone necessitates a further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas* (AS 3959), and the satisfactory compliance of the proposal with the policy measures described in *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 1.4* (the Guidelines) (DPLH & WAPC 2021).

The purpose of this Bushfire Management Plan (BMP) is to assess the bushfire hazards affecting the site (risk) and to identify the 'management' strategies (risk treatments) required to ensure future development can achieve the intent of SPP 3.7 - *to preserve life and reduce the impact of bushfire on property and infrastructure*.

As part of assessing the risk, a Bushfire Attack Level (BAL) assessment involving the classification and condition of vegetation and topography within 150 m of the site (post-development) has been undertaken.

Bushfire hazards identified within 150 m of the site that are assumed to remain in the long-term include:

- Forest (Class A) vegetation to the west of the site and Mandurah Road.
- Shrubland (Class C) vegetation to the east of the site within the proponent's broader landholding, which is a temporary hazard and will be removed when residential development progresses.
- Scrub (Class D) vegetation to the east of the site within the proponent's broader landholding, which is a temporary hazard and will be removed when residential development progresses.
- Scrub (Class D) vegetation to the north within Bush Forever Site 395 (Rockingham Lake Regional Reserve) and to the west within the Mandurah Road reserve.
- Grassland (Class G) vegetation within the road reserves to the northwest of the site.

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Vegetation to the east of the site within Lot 9009 Mandurah Road and 100 m of proposed lots will be managed by the proponent to achieve low threat in accordance with AS 3959 until residential development in this area is progressed. This will include clearing or modification of existing vegetation. All other areas of land identified as low threat that are external to the site are existing and are assumed to continue to be managed in accordance with existing land management practices.

Compliance assessment

The bushfire protection criteria provided in the Guidelines represents the risk treatments applicable to achieving the intent and the objectives listed in SPP 3.7. The bushfire protection criteria are divided into four subsystems (elements), plus a standalone element for tourism. Each subsystem is provided to the decision maker with an intent and solution method, either performance principle or acceptable solution (predetermined solution). Compliance with each subsystem (as a risk treatment) is required to demonstrate that the risk is within acceptance.

The BMP has identified that future development within the site (future residential buildings) will comply with the 'acceptable solution' for each of the applicable bushfire protection criteria outlined in the Guidelines.

This includes:

- **Element 1 Location:** All future habitable buildings will be able to achieve BAL-29 or lower as part of the proposed subdivision.
- **Element 2 Siting and design:** The BAL assessment undertaken as part of the BMP indicates that it is possible for all future habitable buildings to achieve BAL-29 or less, with future residential buildings expected to be predominantly subject to BAL-LOW or BAL-12.5. The key hazard applicable to the site is vegetation associated with the Bush Forever site to the north. Asset Protection Zones (APZs) are able to be achieved for all lots through the management of residential lots and the provision of managed public open space and road reserves (existing and proposed). To manage impacts from temporary hazards, the proponent will manage the undeveloped eastern portions of Lot 9009 Mandurah Road that are within 100 m of proposed lots to achieve low threat until residential development in that area progresses.
- **Element 3 Vehicular access:** All proposed public roads within the site will meet the minimum technical requirements of the Guidelines, with road reserves varying between 12 m and 22 m wide. The proposed subdivision will provide multiple access and egress points onto the existing Everest Parkway to the south (an east-west connector) consistent with the structure plan. Everest Parkway provides multiple connections to different destinations, including Mandurah Road to the west, a major north-south connector, and Badgerup Avenue to the south, which provides connections to Lake Valley Drive (an east-west connector) and surrounding suburbs to the south. The proposed road in the northern portion of the site provides a left-in access to the site from Mandurah Road, in accordance with the approved structure plan and requirements of Main Roads WA. This is a legacy consideration, as per Section 2.7 of SPP 3.7 and a requirement of the approved structure plan. A no-through road will be constructed within the site as part of the staging of development in implementing the approved structure plan. This is less than 200 m in length and will meet the requirements of the Guidelines including the provision of suitable turning areas.

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- **Element 4 Water:** The development will be provided with a permanent and reticulated water supply to support onsite firefighting requirements. Existing hydrants are located within 200 m of the proposed lots, and additional hydrants will be provided where required as the reticulated water scheme is extended.

The management/mitigation measures to be implemented through the proposed subdivision and development of the site have been outlined as part of this BMP, and through these, the site can appropriately manage risk in accordance with SPP 3.7 and the Guidelines.

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Appendix A

Subdivision and Estate Lot Layout and Staging Plan

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Abbreviation Tables

Table A1: Abbreviations – General terms

General terms	
AS	Australian Standard
APZ	Asset Protection Zone
BAL	Bushfire Attack Level
BMP	Bushfire Management Plan
BPAD	Bushfire Planning and Design
CCW	Conservation Category Wetland
ESA	Environmentally Sensitive Area
FDI	Fire Danger Index
UFI	Unique Feature Identifier

Table A2: Abbreviations – Organisations

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

Table A3: Abbreviations – Legislation and policies

Legislation	
AS 3959	Australian Standard 3959:2018 Construction of buildings in bushfire prone areas
Guidelines	Guidelines for Planning in Bushfire Prone Areas Version 1.4 (DPLH & WAPC 2021)
SPP 3.7	State Planning Policy 3.7 Planning in Bushfire Prone Areas (WAPC 2015)

Table A4: Abbreviations – Planning and building terms

Planning and building terms	
LPS	Local Planning Scheme
MRS	Metropolitan Region Scheme

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Table A4: Abbreviations – units of measurement

Units of measurement	
ha	Hectare
m AHD	m in relation to the Australian height datum

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1 Introduction

1.1 Background

Satterley Property Group (the proponent) are proposing to subdivide a portion of Lot 9009 Mandurah Road, Lakelands (herein referred to as ‘the site’) for residential purposes, which comprises stages 13, 16 and 17 of Ocean Hill Private Estate. The subdivision and staging plan is provided in **Appendix A**.

The site is 17 hectares (ha) in area and is located within the City of Mandurah. It is bounded by Mandurah Road to the west, Bush Forever Site 395 (Rockingham Lake Regional Reserve) to the north, residential development (previous stages of Ocean Hill Private Estate) to the south; and undeveloped land proposed for residential development which is part of the broader Lot 9009 landholding to the east. This site location is shown in **Figure 1**.

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 2021) as shown in **Plate 1**. The identification of a site within an area declared as bushfire prone necessitates further assessment of the determined bushfire risk affecting the site in accordance with *Australian Standard 3959:2018 Construction of buildings in bushfire prone areas (AS 3959)*, and the satisfactory compliance of the proposal with the policy measures described in *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 1.4 (the Guidelines) (DPLH & WAPC 2021)*.

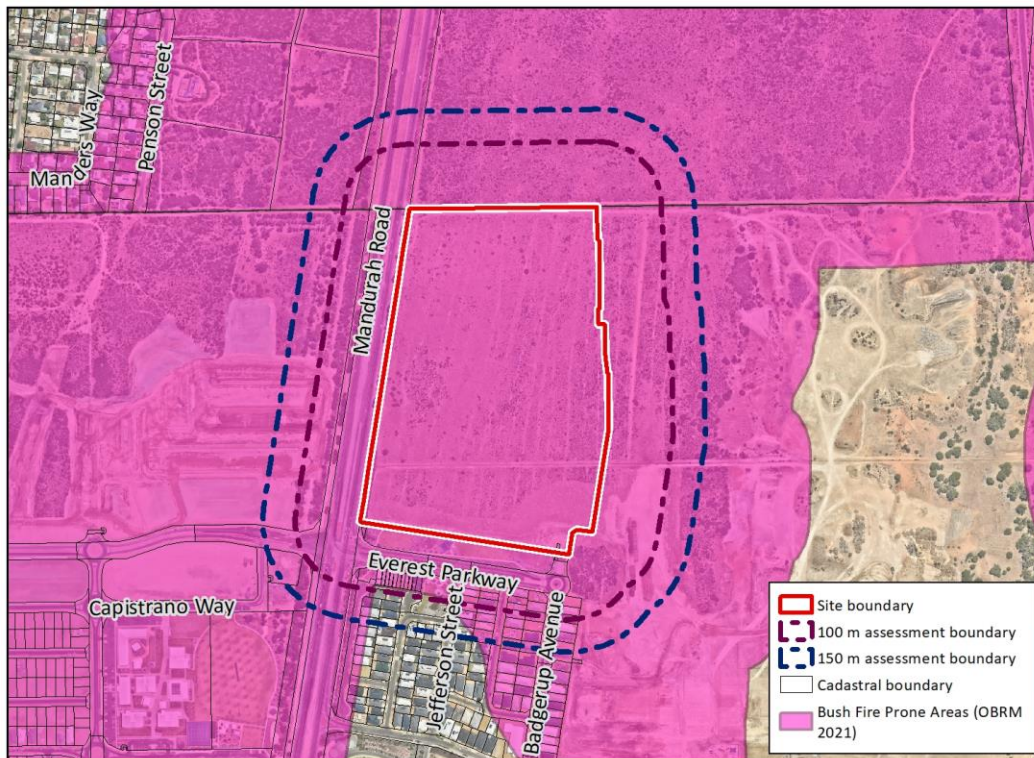


Plate 1: Areas within and surrounding the site, identified as ‘bushfire prone areas’ (under the state-wide Map of Bush Fire Prone Areas (OBRM 2021)), is indicated in purple

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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. Importantly, it is risk-based, requiring a methodical approach to identify and evaluate the hazards and provide the treatments to ameliorate these hazards to an acceptable level. This has been affirmed by the Western Australian Planning Commission (WAPC).

*SPP 3.7 does not require that there be no increase at all in the threat of bushfire to people property or infrastructure. Rather, as is seen in clause 2 of SPP 3.7, the intention of the policy is to 'implement effective, risk-based land use planning and development to preserve life and **reduce the impact of bushfire on property and infrastructure**'. (emphasis added)¹*

1.2 Aim of this report

The purpose of this BMP is to assess bushfire hazards both within the site, and nearby, and demonstrate that the threat posed by any identified hazards can be appropriately mitigated and managed. This BMP has been prepared in accordance with SPP 3.7 (WAPC 2015), the Guidelines (DPLH & WAPC 2021) and AS 3959 (Standards Australia 2018). The document includes:

- An assessment of the existing classified vegetation in the vicinity of the site (within 150 m) and consideration of bushfire hazards that will exist in the post development scenario (**Section 3**).
- Commentary on how the future development can achieve compliance with the bushfire protection criteria outlined within the Guidelines, including an indication of BAL ratings likely to be applicable to future buildings (**Section 5**).
- An outline of the roles and responsibilities associated with implementing this BMP (see **Section 6**).

1.3 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 1.4* (DPLH & WAPC 2021)
- *Australian Standard AS 3959 – 2018 Construction of buildings in bushfire prone areas* (Standards Australia 2018)

¹ Harmanis Holdings No. 2 Pty Ltd and Western Australian Planning Commission [2019] WASAT 43 (Harmanis).

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1.4 Description of the proposed development

The site is proposed to be subdivided into 287 residential lots, and includes a landscaped road reserve (adjacent Mandurah Road) and a public open space area (approximately 0.4 ha in size). The subdivision layout is shown in **Appendix A**.

The site is zoned 'Urban' under the Metropolitan Region Scheme (MRS) and 'Urban Development' under the City of Mandurah Local Planning Scheme No. 12 (LPS No.12), as shown in **Plate 2** below. The proposed residential subdivision is in accordance with the zoning of the land and follows the approved Lakelands North (Ocean Hill) Structure Plan, including the specified road access to/from Mandurah Road.

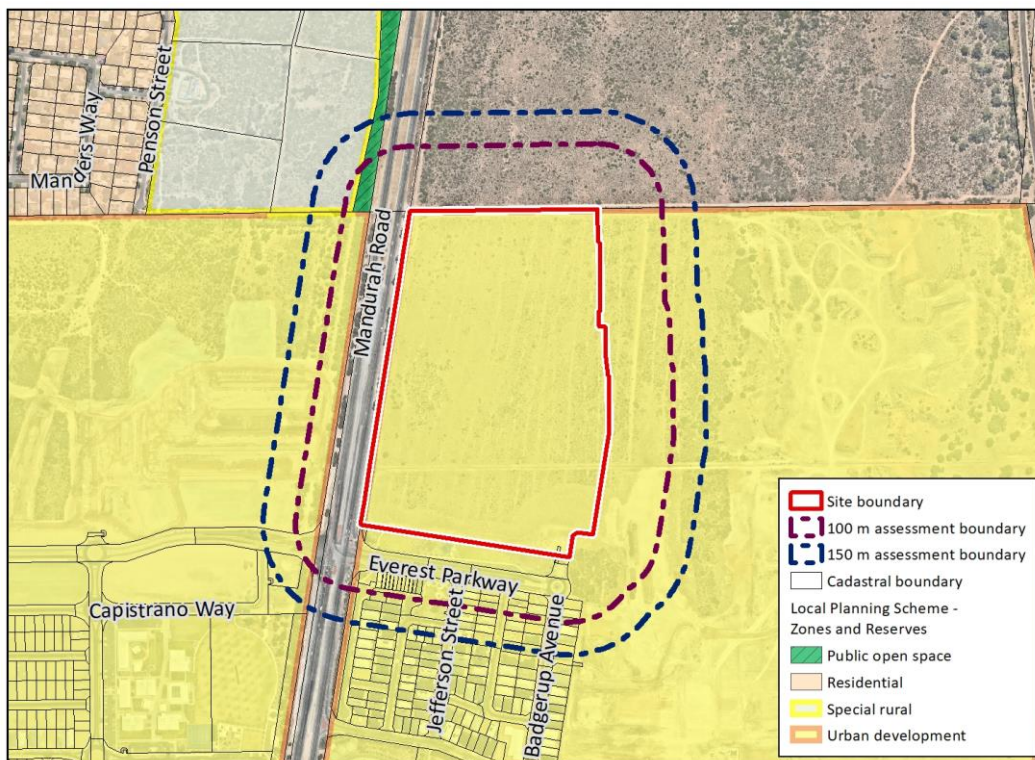


Plate 2: Local Planning Scheme Zoning, in and surrounding the site.

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1.5 Description of land characteristics

Based on the observed site conditions and a review of publicly available historical aerial photography, the vegetation coverage across the site appears to have slowly degraded over time,. Extensive quarrying has occurred in the broader Lot 9009 landholding to the east, commencing in the late 1970's. A Bush Forever Site 395, to the north, has largely remained intact. Urban development is present to the north of Bushfire Forever Site 395, as well as to the south, south-east and west in accordance with approved structure plans.

A review of publicly available contour data indicates that the elevation across the site is undulating, reflecting the dunal landform, varying from 8 m Australian Height Datum (m AHD) to 10 m AHD, as shown in **Figure 1**. Elevation across the site and within the broader Lot 9009 landholding is expected to change as urban development progresses, with the dunal landform being flattened.

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2 Environmental Considerations

In accordance with the *Bushfire Management Plan – BAL Contour* template prepared by the Department of Planning, Lands and Heritage (DPLH) (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 supporting structure plan documentation 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**.

Due to the historic degradation of the site, it contains limited environmental values of conservation significance.

Table 1: Summary of potential environmental considerations that may be associated with the site.

Key environmental feature (information in brackets refers to mapping data source)	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	A review of the <i>Geomorphic Wetlands of the Swan Coastal Plain</i> dataset indicates that no conservation category wetland (CCW) or other wetlands occur within the site or in close proximity that buffers would be a relevant consideration.
RAMSAR wetlands (DBCA-010)	No	No RAMSAR wetlands are identified as occurring within the site or in close proximity.
Threatened and priority flora (DBCA-036) (Emerge Associates 2014)	No	A flora and vegetation survey (Emerge Associates 2014) across the site was undertaken to support the structure plan concluded that no threatened or priority flora occur within the site.
Threatened and priority fauna (DBCA-037) (Emerge Associates 2014)	No	A fauna survey (basic and targeted black cockatoo) (Emerge Associates 2014) found that the existing vegetation within the site is not considered to provide significant foraging habitat for the three black cockatoo (or other fauna) species.
Threatened ecological communities (DBCA-038) (Emerge Associates 2014)	No	The flora and vegetation survey (Emerge Associates 2014) for the site found that no threatened or priority ecological communities occur within the site.
Bush Forever areas (DPLH-019)	No	The site is not identified as a Bush Forever area. Bush Forever Site 395 (Rockingham Lake Regional Reserve) is located immediately to the north of the site.
Clearing regulations – Environmentally sensitive areas (DWER-046)	Yes	Not applicable. No environmentally sensitive areas (ESAs) are identified within the site. An ESA is identified directly north of the site and is associated with Bush Forever Site 395).
Swan Bioplan Regionally Significant Natural Areas 2010 (DWER-070)	No	Not applicable. No Regionally Significant Natural Areas are identified within the site or nearby.

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2.1 Native vegetation – modification and clearing

The majority of the site has been previously cleared and now comprises sparse native and weed dominated shrubland, described as '**GfMsS** - **Gomphocarpus fruticosus* over low open shrubland of *Melaleuca systema* and weed dominated understorey on brown sand with outcropping limestone' (Emerge Associates 2014).

Unless identified for retention in public open space, all vegetation (native regrowth and weed) within the site and within 100 m of the site (where within the proponent landholding, Lot 9009 Mandurah Road) will be cleared and/or modified to achieve low threat as per Section 2.2.3.2 of AS 3959. No vegetation outside the proponent landholding is assumed to be removed or modified to support the implementation of this BMP. Existing land management will continue as per existing conditions.

Where clearing of native vegetation is undertaken in accordance with a subdivision approval under the *Planning and Development Act 2005*, it is exempt from requiring a clearing permit under Schedule 6 of the *Environmental Protection Act 1986* (EP Act). Additionally, a clearing permit will not be required where other exemptions pursuant to Schedule 6 of the EP Act exist, such as Section 33 of the *Bush Fires Act 1954*, or the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (given the site is outside an ESA), such as those associated with a building licence.

2.2 Revegetation and landscape plans

No revegetation is proposed as part of this subdivision and the proposed urban development.

Landscape treatments are proposed to be associated with future public open space areas, residential gardens and verge planting within road reserves. These areas will be able to achieve low threat in accordance with Section 2.2.3.2 of AS 3959, based on standard treatments for urban areas and the requirements of the City of Mandurah firebreak notice.

Where identified as low threat, landscape treatments within the site would need to achieve low threat vegetation in accordance with Section 2.2.3.2 of AS 3959. This is likely to include:

- 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).
- Application of ground/surface covers such as mulch or non-flammable materials as required.
- Regular mowing/slashing of grass to less than 50 mm in height.

Areas may also be excluded as low threat due to size and proximity, as outlined in AS 3959. These areas would not require ongoing management to achieve low threat.

The proponent will be responsible for the maintenance of the site and 100 m management area in the broader Lot 9009 landholding, during the maintenance period and until areas are permanently developed for urban purposes. Following the handover, management of public open space areas will be the responsibility of the City of Mandurah but is not expected to be any different to the typical maintenance of urban parks (where required/assumed).

3 Bushfire Assessment Results

Bushfire risk for the site has been appropriately considered with regard to the potential impact upon the site using AS 3959 and the Guidelines.

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. AS 3959 measures the Bushfire Attack Level (BAL) as the radiant heat level (kW/m^2) over a distance of 100 m. AS 3959 also prescribes deemed-to-satisfy construction responses that can resist the determined radiant heat level at a given distance from the fire. It is based on six Bushfire Attack Level (BAL) ratings: BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40 and BAL-FZ.

A BAL contour plan has been prepared in accordance with Appendix Three of the Guidelines and Method 1 of AS 3959 to determine the BAL ratings likely to be applicable to future buildings. This has been based on the vegetation classifications and the effective slope under the vegetation (post-development scenario).

3.1 Assessment inputs

The BAL assessment was undertaken in accordance with Method 1 of AS 3959. Vegetation classifications and effective slope have been detailed in **Table 2** and **Figure 2** and a site assessment was completed on 10 April 2024.

3.1.1 Inputs and assumptions

The BAL assessment is based on the following inputs and assumptions:

- **Designated Fire Danger Index (FDI):** 80
- **Flame temperature:** 1090 K
- **Effective slope beneath classified vegetation:** flat/upslope (see **Figure 2**)
- Vegetation to be retained within the site in future public open space areas and road reserves (mature trees) will be modified to achieve low threat in accordance with Section 2.2.3.2 of AS 3959 and will be maintained as detailed in **Section 2.2**.
- The proponent will manage a minimum 100 m-wide area within the broader Lot 9009 landholding to achieve low threat in accordance with Section 2.2.3.2 of AS 3959 where vegetation is not proposed for long-term retention. This is to reduce the impact of temporary bushfire hazards on lots within the site.
- Areas of land identified as low threat that are external to the site are assumed to continue to be managed in accordance with existing land management practices and the City of Mandurah Fire Hazard Reduction Notice in the long-term (unless stated otherwise).
- Classified vegetation that has been identified outside of the proponent's landholdings, namely Bush Forever Site 395 (Rockingham Lake Regional Reserve) to the north and the Mandurah Road reserve to the east have been assumed to remain in its current state and will therefore continue to be a bushfire hazard to development within the site.

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3.1.2 Vegetation classification

All vegetation within 150 m of the site was classified in accordance with Section 2.2.3 of AS 3959. The assignment of vegetation classifications is based on an assessment of vegetation structure, including consideration of the various fuel layers of different vegetation types, as outlined in **Plate 3**. Each distinguishable vegetation plot is described in **Table 2** and shown in **Figure 2**.

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. *Vegetation of any 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.*
- d. *Strips of vegetation less than 20 m in width (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 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 wind breaks.*

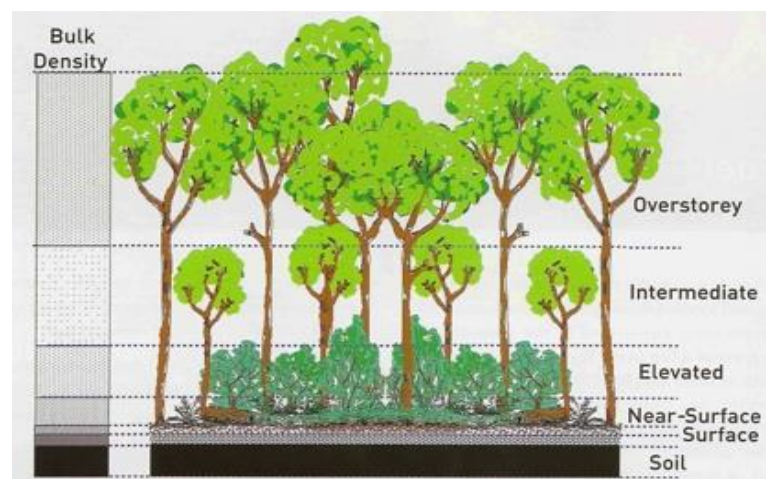


Plate 3: The five fuel layers in a forest environment that could be associated with fire behaviour (Gould et al. 2007)

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Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)

Photo ID:	1	Plot:	1	
Vegetation classification or exclusion clause (and effective slope)				
Class A - Forest (Flat/upslope)				
Description / Justification for Classification				
<p>Forest (Class A) vegetation has been identified to the west of the site and Mandurah Road, comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over a dense understorey of shrubs and grasses. This vegetation is assumed to remain post-development of the site.</p>				
Photo ID:	2	Plot:	1	
Vegetation classification or exclusion clause (and effective slope)				
Class A - Forest (Flat/upslope)				
Description / Justification for Classification				
<p>Forest (Class A) vegetation has been identified to the west of the site and Mandurah Road, comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over a dense understorey of shrubs and grasses. This vegetation is assumed to remain post-development of the site.</p>				
Photo ID:	3	Plot:	1	
Vegetation classification or exclusion clause (and effective slope)				
Class A - Forest (Flat/upslope)				
Description / Justification for Classification				
<p>Forest (Class A) vegetation has been identified to the west of the site and Mandurah Road, comprising tall mature trees 10 – 15 m in height with greater than 30% foliage cover over a dense understorey of shrubs and grasses. This vegetation is assumed to remain post-development of the site.</p>				

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Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)

Photo ID:	4	Plot:	2	<p>-32.45728, 115.76659, -8.4m, 31° 10 Apr 2024 09:48:10</p>
Vegetation classification or exclusion clause (and effective slope)				
Shrubland (Class C) (Flat/upslope)				
Description / Justification for Classification				
<p>Shrubland vegetation was identified to the east of the site within the broader Lot 9009 landholding and is dominated by shrubs less than 2 m in height that are more than 30% foliage cover. This vegetation is a temporary hazard and will be removed in the future as part of residential development in accordance with the structure plan.</p>				
Photo ID:	5	Plot:	2	<p>-32.45698, 115.76665, -10.0m, 87° 10 Apr 2024 09:49:15</p>
Vegetation classification or exclusion clause (and effective slope)				
Shrubland (Class C) (Flat/upslope)				
Description / Justification for Classification				
<p>Shrubland vegetation was identified to the east of the site within the broader Lot 9009 landholding and is dominated by shrubs less than 2 m in height that are more than 30% foliage cover. This vegetation is a temporary hazard and will be removed in the future as part of residential development in accordance with the structure plan.</p>				
Photo ID:	6	Plot:	2	<p>-32.4569, 115.76662, -9.8m, 292° 10 Apr 2024 09:49:25</p>
Vegetation classification or exclusion clause (and effective slope)				
Shrubland (Class C) (Flat/upslope)				
Description / Justification for Classification				
<p>Shrubland vegetation was identified to the east of the site within the broader Lot 9009 landholding and is dominated by shrubs less than 2 m in height that are more than 30% foliage cover. This vegetation is a temporary hazard and will be removed in the future as part of residential development in accordance with the structure plan.</p>				

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Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)

Photo ID:	7	Plot:	3	
Vegetation classification or exclusion clause (and effective slope)				
Scrub (Class D) (Flat/upslope)				
Description / Justification for Classification				
<p>Scrub vegetation has been identified to the immediate north of the site and is associated with Bush Forever Site 395. The predominant vegetation is approximately 2 -4 m in height, with a greater than 30% foliage cover. Trees taller than 6 m are present but forms less than 10% foliage cover and therefore is not the basis for the vegetation classification. This vegetation is to remain the same post-development of the site.</p>				
Photo ID:	8	Plot:	3	
Vegetation classification or exclusion clause (and effective slope)				
Scrub (Class D) (Flat/upslope)				
Description / Justification for Classification				
<p>Scrub vegetation has been identified to the immediate north of the site and is associated with Bush Forever Site 395. The predominant vegetation is approximately 2 -4 m in height, with a greater than 30% foliage cover. Trees taller than 6 m are present but form less than 10% foliage cover and therefore is not the basis for the vegetation classification. This vegetation is to remain the same post-development of the site.</p>				
Photo ID:	9	Plot:	3	
Vegetation classification or exclusion clause (and effective slope)				
Scrub (Class D) (Flat/upslope)				
Description / Justification for Classification				
<p>A narrow strip of scrub vegetation has been identified to the west of the site within the Mandurah Road reserve. This vegetation is approximately 2 -4 m in height with a greater than 30% foliage cover. Trees taller than 6 m are present but form less than 10% foliage cover and therefore is not the basis for the vegetation classification. This vegetation is to remain the same post-development of the site.</p>				

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Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)

Photo ID:	10	Plot:	4	<p>-32.458, 115.76652, -8.9m, 89° 10 Apr 2024 09:46:25</p>
Vegetation classification or exclusion clause (and effective slope)				
Scrub (Class D) (Flat/upslope)				
Description / Justification for Classification				
<p>Scrub vegetation has been identified to the east of the site within the broader Lot 9009 landholding. This vegetation is approximately 2 -4 m in height with a greater than 30% foliage cover. Trees taller than 6 m are present but form less than 10% foliage cover. This vegetation is a temporary hazard and will be removed in the future as part of residential development in accordance with the structure plan.</p>				
Photo ID:	11	Plot:	4	<p>-32.46051, 115.76686, -11.1m, 353° 10 Apr 2024 09:36:24</p>
Vegetation classification or exclusion clause (and effective slope)				
Scrub (Class D) (Flat/upslope)				
Description / Justification for Classification				
<p>Scrub vegetation has been identified to the east of the site within the broader Lot 9009 landholding. This vegetation is approximately 2 -4 m in height with a greater than 30% foliage cover. Trees taller than 6 m are present but form less than 10% foliage cover. This vegetation is a temporary hazard and will be removed in the future as part of residential development in accordance with the structure plan.</p>				
Photo ID:	12	Plot:	6	<p>-32.46051, 115.7654, -17.8m, 196° 10 Apr 2024 09:23:25</p>
Vegetation classification or exclusion clause (and effective slope)				
Exclusion clause 2.2.3.2(b) (<Vegetation 1 ha and > 100m from other classified vegetation)				
Description / Justification for Classification				
<p>An area of remnant native vegetation to the south-east of the site is proposed to be retained in public open space. This vegetation is not proposed to be subject to management but can achieve low threat in accordance with exclusion clause 2.2.3.2 (b) as it is less than 1 ha in area and will not be within 100 m of other areas of classified vegetation once the site is development and the proponent implements management of vegetation within 100 m of the site.</p>				

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Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)

Photo ID:	13	Plot:	7	<p>-32.4599, 115.76588, -15.9m, 178° 10 Apr 2024 09:26:15</p>
Vegetation classification or exclusion clause (and effective slope)				
Exclusion clause 2.2.3.2(e) (Non-vegetated)				
Description / Justification for Classification				
<p>Non-vegetated areas exist to the south and south east of the site, as well as to the west of the site and Mandurah Road, and comprise of mineral earth that has been cleared and earthworked to support residential development. These areas have been excluded in accordance with clause 2.2.3.2(e) of AS 3959 and will continue to achieve low threat when roads and lots are constructed.</p>				
Photo ID:	14	Plot:	8	<p>-32.46126, 115.76265, -12.7m, 161° 10 Apr 2024 10:20:43</p>
Vegetation classification or exclusion clause (and effective slope)				
Exclusion clause 2.2.3.2(e) (Non-vegetated)				
Description / Justification for Classification				
<p>Non-vegetated areas to the south and west of the site (i.e. existing roads (Mandurah Road, Everest Parkway), have been excluded in accordance with clause 2.2.3.2(e) of AS 3959. These areas contain well-managed verges and gardens as well (2.2.3.2 (f)), however for ease of reference have been excluded as non-vegetated.</p>				
Photo ID:	15	Plot:	9	<p>32.46046, 115.76282, -18.3m, 52° 10 Apr 2024 10:18:57</p>
Vegetation classification or exclusion clause (and effective slope)				
Exclusion clause 2.2.3.2(f) (Low threat vegetation)				
Description / Justification for Classification				
<p>Low threat vegetation has been identified to the south of the site within existing public open space areas. These areas are subject to regular ongoing maintenance, with trees pruned and grass below 100 mm in height with no evidence of built-up dead material. Mulch appears to be applied regularly.</p>				

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Table 2: AS 3959 vegetation classifications (refer to **Figure 2**)(continued)

Photo ID:	16	Plot:	9	<p>-32.45571, 115.76158, -20.5m, 43° 10 Apr 2024 10:44:03</p>
Vegetation classification or exclusion clause (and effective slope)				
Exclusion clause 2.2.3.2(f) (Low threat vegetation)				
Description / Justification for Classification				
<p>Low threat vegetation has been identified to the west of the site within the Mandurah Road reserve, and is associated with portions of the verge and medians. Where shown as managed, these areas are subject to regular ongoing maintenance, with trees pruned, grass mowed and no evidence of built-up dead material. These areas may also contain non-vegetated areas as per clause 2.2.3.2 (e), but for ease of reference and given the large size have been excluded as 2.2.3.2 (f).</p>				
Photo ID:	17	Plot:	5	<p>-32.45569, 115.76157, -20.5m, 5° 10 Apr 2024 10:44:09</p>
Vegetation classification or exclusion clause (and effective slope)				
Grassland (Class G) (Flat/upslope)				
Description / Justification for Classification				
<p>Grassland vegetation has been identified in the road reserves northwest of the site characterised by bare ground and grasses. Although it appears to be subject to some management (slashing or similar), it is conservatively assumed that this vegetation is not routinely managed and has therefore been classified as grassland (Class G) post-development of the site.</p>				
Photo ID:	18	Plot:	3	<p>-32.45748, 115.76176, -16.8m, 25° 10 Apr 2024 10:03:28</p>
Vegetation classification or exclusion clause (and effective slope)				
Scrub (Class D) (Flat/upslope)				
Description / Justification for Classification				
<p>Scrub vegetation has been identified to the west of the site within the road reserve adjacent to the site. This vegetation is approximately 2 -4 m in height with a greater than 30% foliage cover. Trees taller than 6 m are present but form less than 10% foliage cover. This vegetation is assumed to remain a permanent hazard post development.</p>				

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3.2 Assessment outputs

The vegetation classifications determined in **Section 3.1** are summarised in **Table 3** and shown in **Figure 2** and incorporate the known changes to vegetation post-development within the site and the determined effective slope.

Table 3: AS 3959 vegetation classification and effective slope applicable to the site

Plot	Applied vegetation classification	Effective slope
1	Class A – Forest	Flat/upslope
2	Class C – Shrubland	Flat/upslope
3	Class D – Scrub	Flat/upslope
4	Class D – Scrub	Flat/upslope
5	Class G – Grassland	Flat/upslope
6	Exclusion 2.2.3.2(b)	N/A
7	Exclusion 2.2.3.2(e)	N/A
8	Exclusion 2.2.3.2(e)	N/A
9	Exclusion 2.2.3.2(f)	N/A

The resultant BAL ratings for the site are shown in **Figure 3**. The BAL ratings are based on the minimum distance outlined in Table 2.5 of AS 3959 for the applicable vegetation classifications and effective slope. The relevant setback distances for the BAL ratings have been summarised for ease of reference in **Table 4**.

The BAL assessment indicates that all lots will be able to achieve BAL-29 or below. The majority of lots within the site will be subject to BAL-12.5 or BAL-LOW. Management of temporary hazards within the proponent's broader landholding assists with achieving this outcome.

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Table 4: Setback distances based on vegetation classification and effective slope and Table 2.5 of AS 3959, as determined by the method 1 BAL assessment.

Plot number (see Figure 2)	Vegetation classification (see Figure 2)	Effective slope (see Figure 2)	Distance to vegetation (from Table 2.5 of AS 3959)	BAL rating
Plot 1	Forest (Class A)	Flat/upslope	< 16 m	BAL-FZ
			16 - < 21 m	BAL-40
			21 - < 31 m	BAL-29
			31 - < 42 m	BAL-19
			42 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 2	Shrubland (Class C)	Flat/upslope	< 7 m	BAL-FZ
			7 - < 9 m	BAL-40
			9 - < 13 m	BAL-29
			13 - < 19 m	BAL-19
			19 - < 100 m	BAL-12.5
			> 100 m	BAL-LOW
Plot 3 and 4	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
Plot 5	Grassland (Class G)	Flat/upslope	< 6 m	BAL-FZ
			6 - < 8 m	BAL-40
			8 - < 12 m	BAL-29
			12 - < 17 m	BAL-19
			17 - < 50 m	BAL-12.5
			> 50 m	BAL-LOW

4 Identification of Bushfire Hazard Issues

From a bushfire hazard management perspective, based on the requirements of SPP 3.7 and the Guidelines, the key issues that are likely to require management and/or consideration as part of future development within the site, particularly for the construction of new habitable buildings, include:

- Provision of appropriate separation distance from bushfire hazards to ensure a BAL rating of BAL-29 or less can be achieved at buildings (built form). This includes the management of temporary hazards (shrubland and scrub vegetation) to the east of the site e.g., removal of existing shrubland and scrub vegetation that occurs within the proponent's landholding within 100 m of the site to achieve a BAL-LOW rating. Alternatively, the managed strip could be reduced to ensure lots achieve BAL-29, namely a 9 m-wide strip.
- Ensuring that the site has access to a road network that supports egress to multiple destinations and that temporary no through roads as a result of staging of development are less than 200 m long with suitable turn-around areas or are provided with temporary emergency access ways.
- Ensuring that the public open space areas within the site (where assumed to be low threat as per clause 2.2.3.2 (f) of AS 3959) are designed, implemented, and managed to achieve low threat to reduce the impact of bushfire and risk of fires starting onsite.
- Ensuring that the provision of water for firefighting is sufficient and accessible by firefighting services will require each lot to provide a standalone water supply.

4.1 Permanent hazards

The land surrounding the site comprises a mix of uses, including nature reserves with remnant native vegetation (Bush Forever site 395), existing urban residential development and undeveloped land zoned for future urban residential development (future stages of the Lakelands North Ocean Hill Structure Plan).

The predominant bushfire hazards relevant to the site is the shrubland (Class C) and Scrub (Class D) vegetation to the north, west respectively.

Classified scrub vegetation is expected to remain to the north within the Bush Forever Site 395 (Rockingham Lake Regional Reserve), similarly for existing unmanaged vegetation within Mandurah Road reserve. No management of vegetation or fuel loads is assumed in these areas for the purposes of this BMP.

4.2 Temporary hazards

Once subdivision commences and vegetation is removed within the site (where not proposed to be retained) the entire site will need to be managed by the proponent to achieve low threat at all times until the lots are sold after which it will be landowners responsibility to maintain in accordance with this BMP and the City of Mandurah firebreak notice.

The shrubland vegetation to the immediate east of the site (within areas under the control of the proponent) is expected to be removed when this area is developed in the future in accordance with

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the Lakelands North Ocean Hill Structure Plan. Therefore, this vegetation is considered to be a temporary hazard.

If the entire site is not cleared of classified vegetation as a single stage of works, the proponent will need to ensure the minimum area around each stage is cleared/managed to ensure BAL-29 or less can be achieved at future residential buildings. A minimum 100 m-wide managed zone around each stage within the site and the broader Lot 9009 landholding is recommended to be implemented to reduce the impact of temporary bushfire hazards, or alternatively can be the minimum width to achieve BAL-29 (9 m based on shrubland vegetation). Vegetation will need to be managed by the proponent until residential development in those areas progresses and will include regular slashing/mowing of grass/weedy regrowth within the newly created lots.

4.3 Vulnerable or high risk land use

The definition of a vulnerable land use is where occupants are less able to respond in an emergency. The types of land uses considered vulnerable include *“facilities that, due to the building design or use, or the number of people accommodated, are likely to present evacuation challenges.”* This generally includes (but is not limited to) schools, hospitals, aged care facilities and similar. The identification of a land use as a vulnerable use is at the discretion of the decision maker.

A high-risk land use is one where practices that occur within the site may lead to a potential ignition and spread of a fire from the site or could prolong the duration or intensity of a bushfire should a fire arrive from outside the site.

No vulnerable or high-risk land uses are currently proposed as part of the subdivision.

5 Assessment Against the Bushfire Protection Criteria

The bushfire protection criteria provided in the Guidelines represents the risk treatments applicable to achieving the intent and the objectives listed in SPP 3.7. The bushfire protection criteria are divided into four subsystems (elements), plus a standalone element for tourism. Each subsystem is provided with an intent and solution methods, either performance principle or acceptable solution (one predetermined solution). Compliance with each subsystem (as a risk treatment) is required to demonstrate to the decision maker that the risk is within acceptance.

The bushfire protection criteria identified in the Guidelines and addressed as part of this BMP are:

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

The proposed subdivision has been considered against the bushfire protection criteria in **Table 5**. The assessment demonstrates that the development can achieve the objectives of SPP 3.7 and addresses the criterion through acceptable solutions detailed in the Guidelines.

Table 5: Assessment against the bushfire protection criteria from the Guidelines

Bushfire protection criteria	Proposed bushfire management strategies
Element 1: Location	
A1.1 Development location	<p>The proposed subdivision is in accordance with the approved structure plan, which included a bushfire management plan addressing bushfire risk. The BAL assessment, discussed in Section 0, indicates that all proposed lots are able to provide an area where future habitable buildings can achieve BAL-29 or less.</p> <p>The proposal complies with A1.1.</p>
Element 2: Siting and design	
A2.1 Asset Protection Zone (APZ)	<p>All lots are required to be managed to a low threat condition with a minimum Asset Protection Zone (APZ) equivalent to enable BAL-29 to be achieved at the habitable building. APZs are typically contained within a lot but can also include areas external to a lot that achieve low threat in accordance with Section 2.2.3.2 of AS 3959 where the APZ cannot be contained within the lot boundaries (such as managed road reserves or public open space).</p> <p>As outlined in Section 3.1, classified scrub vegetation occurs to the west and north of the site; however, separation provided by the proposed public road network will ensure appropriate hazard separation so that future habitable buildings can achieve BAL-29 or less (lots are predicted to be subject to BAL-19 or less). Classified shrubland and scrub vegetation to the east of the site (will be managed by the proponent to achieve low threat until urban development in this area progresses. This will enable future buildings in the eastern portion of the site to achieve BAL-LOW. As noted previously, while this BMP recommends a managed 100 m low threat interface, the managed interface only needs to be the minimum to ensure lots achieve BAL-29, which is 9 m-wide.</p> <p>The proposal complies with A2.1.</p>

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Table 5: Assessment against the bushfire protection criteria from the Guidelines (continued)

Bushfire protection criteria	Proposed bushfire management strategies
Element 3: Vehicular access	
A3.1 Public roads	<p>All proposed public roads within the site can and will meet the minimum technical requirements for public roads compliant with the local government standards and with A3.1 Table 6 column 1 of the Guidelines (see Plate 4 below). The proposed road reserves are between 12 m and 22 m wide (refer to Appendix A).</p> <p>The proposal complies with A3.1.</p>
A3.2a Multiple access routes	<p>The proposed subdivision is in accordance with the approved structure plan, providing access and egress onto the existing Everest Parkway to the south (an east-west connector) and Badgerup Avenue providing for multiple access routes. Everest Parkway provides multiple connections to different destinations, including onto Mandurah Road to the west, a major north-south connector, while Badgerup Avenue to the south provides connections to Lake Valley Drive (an east-west connector) and surrounding suburbs to the south.</p> <p>The proposed road along the northern boundary of the site provides a left-in only access to the site from Mandurah Road, in accordance with the approved structure plan and requirements of Main Roads WA. This is a legacy consideration (as per Section 2.7 of the Guidelines) and a restriction of the approved structure plan (which also had an approved BMP). Vehicles will be able to circulate using this road, but will not be able to access Mandurah Road to exit west. The road network is shown in Figure 4.</p>
A3.2b Emergency access way	<p>Not applicable. No emergency access ways are required to achieve compliance given the public roads provide suitable access.</p> <p>Depending upon the staging of development, temporary emergency access ways may be required to link stages of development to the existing road network to provide for access to two different destinations. Where required, these should be provided in accordance with Appendix Four and table 6 of the Guidelines.</p> <p>The proposal is compliant with A3.2a.</p>
A3.3 Through-roads	<p>The majority of the proposed roads within the site are through-roads, refer to Figure 4. An exception is where the left-in road at the north is located, where a no-through road is proposed to manage vehicle access to satisfy the requirements of the structure plan and Main Roads Western Australia (although an alternative arrangement is also shown, which would enable circulation in an easterly direction). Should the no-through arrangement be applied, it is less than 200 m in length and satisfies the requirements of A3.3.</p> <p>A number of temporary no-through roads will be required within the site (refer to Figure 4) due to staging of development for the broader structure plan (with adjacent stages to the south and east progressing currently). These temporary no-through roads will be less than 200 m in length to the closest intersection and will meet the requirements of a public road including suitable turning areas as per Appendix Four of the Guidelines and/or as agreed with the City of Mandurah. Furthermore, as part of staged development within the site it is possible that no-through roads will be required. Where this is the case, they should comply with the requirements of the Guidelines or satisfy the exceptions, although given the commitment of the proponent to maintain the areas to the east of the site, the no-through roads will be located within a BAL-LOW area and not a relevant consideration.</p> <p>The proposal complies with A3.3.</p>

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Table 5: Assessment against the bushfire protection criteria from the Guidelines (continued)

Bushfire protection criteria	Proposed bushfire management strategies
Element 3: Vehicular access (continued)	
A3.4a Perimeter roads	<p>A perimeter road is a public road between lots and classified vegetation (unless it is grassland) and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision).</p> <p>A perimeter road has been provided between the proposed lots and permanent bushfire hazards to the north and west of the site. A perimeter road is not provided to the east due to the staging of development as part of the broader structure plan, however, is not required given a 100 m-wide managed interface will be implemented and classified vegetation will no longer be located within 100 m of lots.</p> <p>The proposal complies with A3.4a.</p>
A3.4b Fire service access route	No fire service access route is proposed or required to achieve compliance. Therefore A3.4b is not applicable.
A3.5 Battle-axe access legs	No battle-axe legs are proposed and therefore A3.5 is not applicable.
A3.6 Private driveway longer than 70 metres	Not applicable to subdivision. Furthermore, no portion of any proposed lot is more than 70 m from a public road and is also within an area where the speed limit will be less than 70 km/h and will be serviced by a reticulated water supply. Accordingly, lots within the site will not be required to comply with the private driveway technical requirements of the Guidelines.
Element 4: Water	
A4.1 Reticulated areas	Not applicable to subdivision applications.
A4.2 Provision of water for firefighting purposes	The site is located in a reticulated water supply area. Hydrants exist along Everest Parkway within 200 m of the site, as shown in Figure 4 . The reticulated water scheme will be extended as part of the subdivision within the site and additional hydrants will be supplied in accordance with the water authority requirements (and the standard requirements of subdivision).

Table 6: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public roads	2 Emergency access way ¹	3 Fire service access route ¹	4 Battle-axe and private driveways ²
Minimum trafficable surface (metres)	In accordance with A3.1	6	6	4
Minimum horizontal clearance (metres)	N/A	6	6	6
Minimum vertical clearance (metres)	4.5			
Minimum weight capacity (tonnes)	15			
Maximum grade unsealed road ³	As outlined in the IPVVEA Subdivision Guidelines	1:10 (10%)		
Maximum grade sealed road ³		1:7 (14.3%)		
Maximum average grade sealed road		1:10 (10%)		
Minimum inner radius of road curves (metres)		8.5		

Notes:

¹ To have crossfalls between 3 and 6%.

² Where driveways and battle-axe legs are not required to comply with the widths in A3.5 or A3.6, they are to comply with the Residential Design Codes and Development Control Policy 2.2 Residential Subdivision.

³ Dips must have no more than a 1 in 8 (12.5% -7.1 degree) entry and exit angle.

Plate 4: Excerpt of Table 6 from The Guidelines

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5.1 Additional management strategies

5.1.1 Future approval considerations

The BAL assessment in this BMP assesses the potential bushfire risk posed to future habitable buildings within the site, based on the assumptions outlined in **Section 3**.

Following the creation of lot titles, a building licence will be required before the dwelling construction can commence.

Future Class 1, 2, 3 and 10a buildings designated bushfire prone and within an area subject to a BAL rating of BAL-12.5 or higher, will need to satisfy construction standards in accordance with the National Construction Code (NCC) (e.g., AS 3959 or the National Association for Steel-framed Housing).

5.1.2 Vegetation management

5.1.2.1 Within the site

Lots

All lots, once created, are required to be managed by the relevant landowner to a minimal fuel condition and achieve low threat as per Section 2.2.3.2 of AS 3959, in accordance with this BMP and the City of Mandurah Fire Hazard Reduction Notice (as published).

Public road reserves

Road pavement within public road reserves are excluded pursuant to clause 2.2.3.2 of AS 3959 as non-vegetated.

Nature strips (verges) within public road reserves are excluded pursuant to clause 2.2.3.2(f) of AS 3959, where they are listed as a type of use/vegetation that can be excluded. Specific management is not required.

Public open space

As outlined in previous sections of the BMP, the POS areas within the site will be landscaped and managed to a low threat condition in accordance with Section 2.2.3.2 of AS 3959 (and described in **Section 2.2** of this BMP) and will be the responsibility of the proponent initially, and following handover, will be the responsibility of the City of Mandurah.

5.1.2.2 Surrounding the site

Low threat area managed by the proponent

Where within the proponent's landholdings and the Lakelands North (Ocean Hill) Local Structure Plan, a minimum 100 m-wide area of vegetation, directly adjacent to the eastern boundary of the site (see **Figure 4**) will be managed to achieve a low threat in accordance with Section 2.2.3.2 of AS 3959. This area will be maintained by the proponent until future residential development in this area progresses in accordance with the Lakelands North (Ocean Hill) Local Structure Plan.

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Alternatively, the proponent could also manage a narrower strip, 9 m wide, which would still ensure affected lots achieve BAL-29. The BAL ratings affecting lots within this BMP would be different to that currently shown in the BAL Contour Plan (**Figure 3**) but could still achieve BAL-29 or less. If the management strip was narrower, an updated BAL assessment would be required to support building licence.

Private landholdings, public roads and public open space areas

Where indicated as a low threat in **Figure 2**, it is assumed that areas surrounding the site will be managed by the applicable landowners/land managers in accordance with existing maintenance regimes and where relevant City of Mandurah Fire Hazard Reduction Notice (as published).

Where indicated as classified vegetation in **Figure 2**, areas have been assumed to remain a bushfire hazard in the long-term.

5.1.3 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 website (<https://www.dfes.wa.gov.au/bushfire/prepare/>) provides a range of materials to help the community prepare for and survive the bushfire season.

The City of Mandurah provides bushfire advice to residents available from their website <https://www.mandurah.wa.gov.au/live/residents/health-and-safety/fire-safety>. 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.

In the case of a bushfire in the area, advice would be provided to residents by DFES, and/or the City of Mandurah on any specific recommendations with regard to responding to the bushfire, including evacuation if required.

6 Responsibilities for Implementation and Management of Bushfire Measures

Table 6 outlines the future responsibilities of the proponent/developer to be undertaken to support the clearance of titles. These items will be certified by a bushfire consultant.

Table 6: Responsibilities for the implementation of this BMP prior to issue of titles

Developer/landowner	
No.	Implementation action
1	Ensure all classified vegetation in the site (or within 100 m of lots being titled) is either removed or modified to a low threat condition, and each lot is maintained as low threat in accordance with section 2.2.3.2 of AS 3959 until the lot is sold. The minimum area managed should ensure lots to achieve BAL-29 or less.
2	Implement and maintain the 100 m wide low threat managed interface or the minimum area to achieve BAL-29 (to the east of the site (where not proposed for retention and within the Lot 9009 landholding), refer to Figure 4 , until future urban development in accordance with the broader Lakelands North Ocean Hill Structure Plan progresses. This includes (but is not limited to): <ul style="list-style-type: none"> • Ongoing slashing/removal of vegetation; and/or • Herbicide treatment (or similar) and removal of built-up dead matter.
3	Install the public roads to the standards outlined in Appendix Four of the Guidelines or as agreed with the City of Mandurah. Public road reserves should be designed and maintained to achieve low threat in accordance with Section 2.2.3.2 of AS 3959.
4	Install no-through roads in accordance with Appendix Four of the Guidelines or as agreed with the City of Mandurah. This includes the provision of appropriate turn-around areas.
5	Reticulated water supply and hydrants are to be installed as per standard water authority requirements unless otherwise agreed.
6	As part of staged development, two access routes must be provided at all times other than: <ul style="list-style-type: none"> • Temporary no-through roads that meet the requirements of the Guidelines with suitable turning heads. • If emergency access ways are required temporarily to provide two access routes during staging, they must be provided in accordance with the minimum technical requirements of Appendix Four and Table 6 of the Guidelines.

Table 7 outlines the future responsibilities of the proponent, future landowners and the City of Mandurah associated with implementing this BMP with reference to ongoing bushfire risk mitigation measures for existing land uses (through compliance with the City's fire hazard reduction notice) or future mitigation measures to be accommodated as part of the development process but not necessarily for title clearances. These responsibilities will need to be considered as part of the subsequent development and implementation process.

Bushfire Management Plan

Portion 9009 Mandurah Road, Lakelands



Table 7: Responsibilities for the implementation of this BMP during development (building construction) and ongoing

Developer/landowner	
No.	Implementation action
1	<p>Ongoing management of the site to achieve low threat as specified in Table 6, Item 1 to support the creation of titles.</p> <p>As part of the development works, the areas of public open space and road reserves within the site should be designed and implemented to achieve a low threat standard in accordance with Section 2.2.3.2 of AS 3959. Where present, mature trees can be retained. Ongoing management is likely to include (but is not limited to):</p> <ul style="list-style-type: none"> • 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. • Application of ground/surface covers such as mulch or non-flammable materials as required. • Regular mowing/slashing of grass to less than 100 mm in height <p>Maintenance will be the responsibility of the proponent until handover to the City of Mandurah.</p>
Property (lot) owners	
No.	Implementation action
1	Where within a bushfire prone area, ensuring the construction of new dwelling/s complies with AS 3959, as per the applicable BAL rating, determined as part of this BMP (outlined within Section 3) or through a separate BAL assessment.
2	Ensure access to fire hydrants is maintained.
3	Maintain the lot to a low threat standard in accordance with Section 2.2.3.2(e) and (f) of AS 3959 and the principles of the Asset Protection Zones Standard of Schedule 1 of the Guidelines and/or the City of Mandurah fire hazard reduction notice requirements, whichever is the higher standard.
City of Mandurah	
No.	Management action
1	Maintaining fuel loads in existing public road reserves and public open space (under their management) to appropriate standards to minimise fuel loads.
2	Monitoring vegetation fuel loads in private landholdings against the requirements of the City's fire hazard reduction notice (and/or existing maintenance regimes outlined in this BMP) and liaising with relevant stakeholders to maintain fuel loads at minimal/appropriate fuel levels, in accordance with the City's responsibilities under the <i>Bush Fires Act 1954</i> .
Water Corporation	
No.	Management action
1	Ensure water hydrants in adjacent road reserves are maintained and accessible to fire services at all times.

Bushfire Management Plan

Portion 9009 Mandurah Road, Lakelands



7 Applicant Declaration

7.1 Accreditation

This assessment has been prepared by Emerge Associates who have been providing bushfire risk management advice for more than 10 years, undertaking detailed bushfire assessments (and associated approvals) to support the land use development industry. Emerge Associates have a number of team members who have undertaken Bushfire Planning and Design (BPAD) Level 1 and Level 2 training and are Fire Protection Association of Australia (FPAA) accredited practitioners.

Anthony Rowe is a FPAA Level 3 BPAD accredited practitioner (BPAD No. 36690) in accordance with clause 6.12 of the Guidelines.

7.2 Declaration

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

Reviewer signature:

A handwritten signature in black ink, appearing to read "Anthony Rowe", written over a light grey dotted grid background.

Name: Anthony Rowe

Company: Emerge Associates/Envision Bushfire Planning

Date: 28/05/2024

BPAD Accreditation: BPAD No. 36690

8 References

8.1 General references

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

Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*, Western Australia, <<https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-swan-coastal-plain>>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022b, *Threatened Ecological Communities (DBCA-038)*, Perth, Western Australia <<https://catalogue.data.wa.gov.au/dataset/threatened-ecological-communities>>.

Department of Water (DoW) 2008, *LiDAR Elevation Dataset, Swan Coastal Plain*, Perth.

Department of Planning, Lands and Heritage (DPLH) 2019, *Bush Forever Areas 2000 (DPLH-019)*, <<https://catalogue.data.wa.gov.au/org/departement-of-planning-lands-and-heritage>>.

Department of Planning, Lands and Heritage, and Western Australian Planning Commission, (DPLH & WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas Version 1.4*, Perth, Western Australia.

Department of Water and Environmental Regulation (DWER) 2021, *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*, <<https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046>>.

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.

Office of Bushfire Risk Management (OBRM) 2021, *Map of Bush Fire Prone Areas*, Landgate, <https://maps.slip.wa.gov.au/landgate/bushfireprone/>.

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

Western Australian Land Information Authority (WALIA) 2023, *Landgate Map Viewer Plus*.

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

Bushfire Management Plan

Portion 9009 Mandurah Road, Lakelands



Department of Biodiversity, Conservation and Attractions (DBCA) 2017, *Ramsar Sites (DBCA-010)*.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022a, *Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)*, Western Australia, <<https://catalogue.data.wa.gov.au/dataset/geomorphic-wetlands-swan-coastal-plain>>.

Department of Biodiversity, Conservation and Attractions (DBCA) 2022b, *Threatened Ecological Communities (DBCA-038)*, Perth, Western Australia <<https://catalogue.data.wa.gov.au/dataset/threatened-ecological-communities>>.

Department of Planning, Lands and Heritage (DPLH) 2019, *Bush Forever Areas 2000 (DPLH-019)*, <<https://catalogue.data.wa.gov.au/org/department-of-planning-lands-and-heritage>>.

Department of Planning, Lands and Heritage, and Western Australian Planning Commission, (DPLH & WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas Version 1.4*, Perth, Western Australia.

Department of Water and Environmental Regulation (DWER) 2021, *Clearing Regulations - Environmentally Sensitive Areas (DWER-046)*, <<https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046>>.

Emerge Associates 2014, *Spring Flora and Vegetation Assessment - Lot 101 Mandurah Road Lakelands*.

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.

Office of Bushfire Risk Management (OBRM) 2021, *Map of Bush Fire Prone Areas*, Landgate, <https://maps.slip.wa.gov.au/landgate/bushfireprone/>.

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.

Bushfire Management Plan

Portion 9009 Mandurah Road, Lakelands



8.2 Online references

The online resources that have been utilised in the preparation of this report are referenced in **Section 8.1**, with access date information provided in **Table R-1**.

Table R 1 Access dates for online references

Reference	Date accessed	Website or dataset name
Landgate 2024	12.03.2024	https://map-viewer-plus.app.landgate.wa.gov.au/index.html
(OBRM 2021)	12.03.2024	Bush Fire Prone Areas
(DBCA 2022a)	12.03.2024	Geomorphologic Wetlands, Swan Coastal Plain
(DBCA 2017)	12.03.2024	Ramsar Sites
(DBCA 2022b)	12.03.2024	Threatened ecological communities
(DWER 2021)	12.03.2024	Environmentally Sensitive Areas
(DPLH 2019)	12.03.2024	Bush Forever areas

Figures

Figure 1: Site Location and Topographic Contours

Figure 2: AS 3959 Vegetation Classification and Effective Slope

Figure 3: Bushfire Attack Level Contour Plan

Figure 4: Spatial Representation of Bushfire Management Strategies

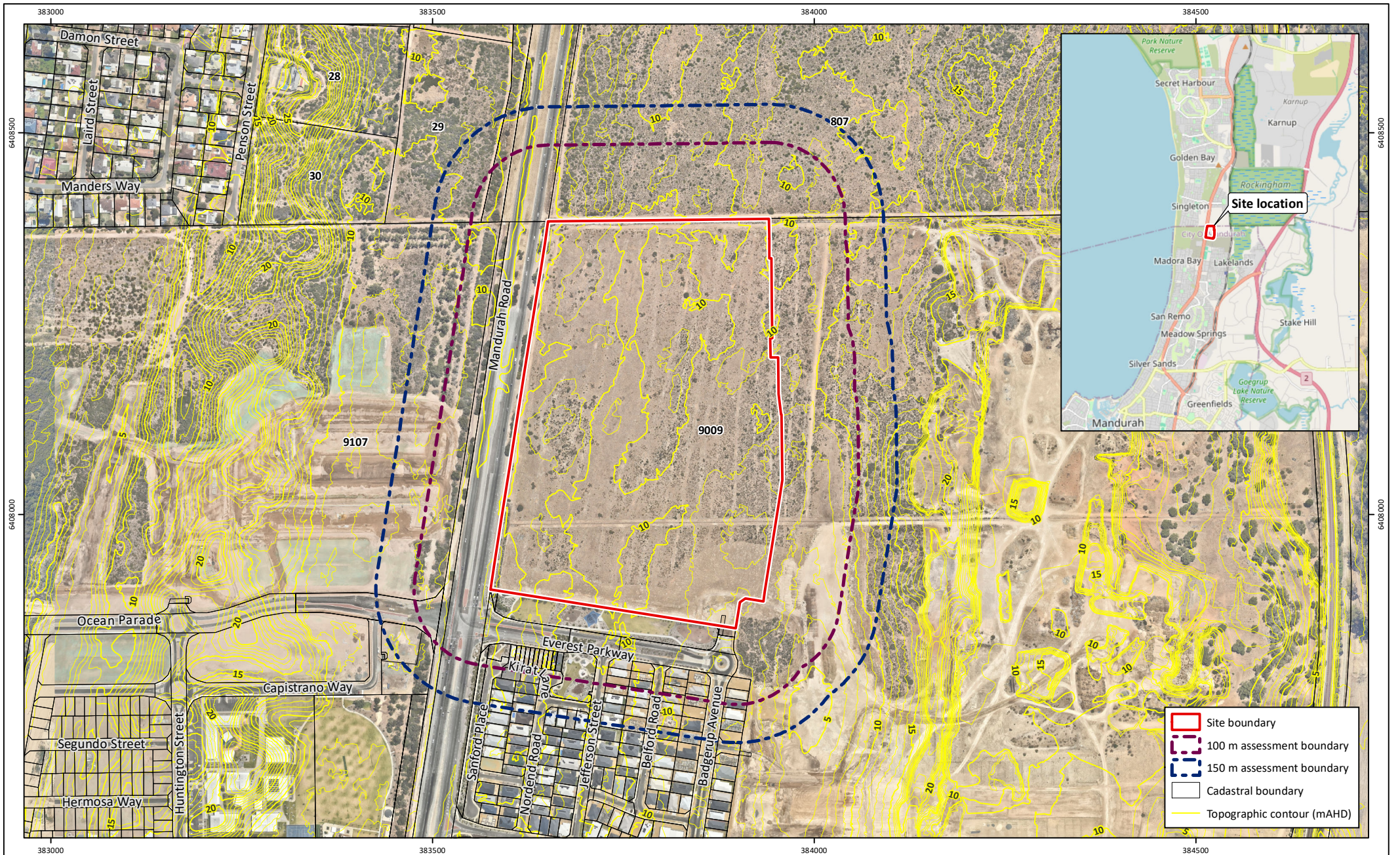
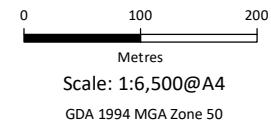


Figure 1: Site Location and Topographic Contours

Project: Bushfire Management Plan
 Portion 9009 Mandurah Road, Lakelands
Client: Satterley Property Group

Plan Number:
 EP15-019(47)-F180
Drawn: WJC
Date: 19/04/2024
Checked: SPL
Approved: KK
Date: 13/05/2024



While Emmerge Associates makes every attempt to ensure the accuracy and completeness of data, Emmerge accepts no responsibility for externally sourced data used
 ©Landgate (2024). Nearmap Imagery date: 31/01/2024

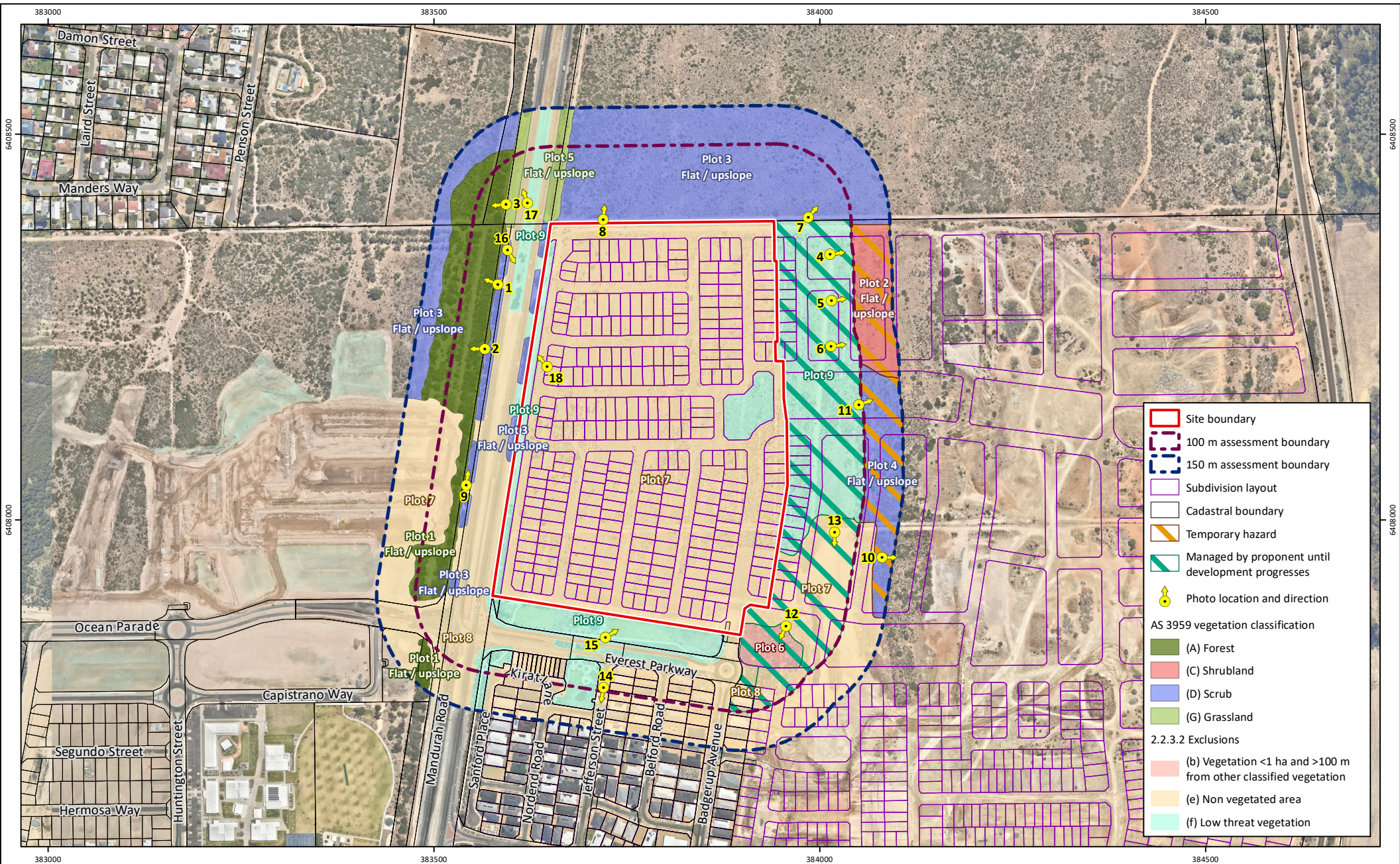


Figure 2: AS 3959 Vegetation Classification and Effective Slope

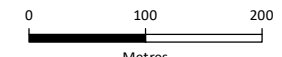
Project: Bushfire Management Plan
Portion 9009 Mandurah Road, Lakelands

Client: Satterley Property Group

Plan Number:
EP15-019(47)-F181

Drawn: WJC
Date: 19/04/2024

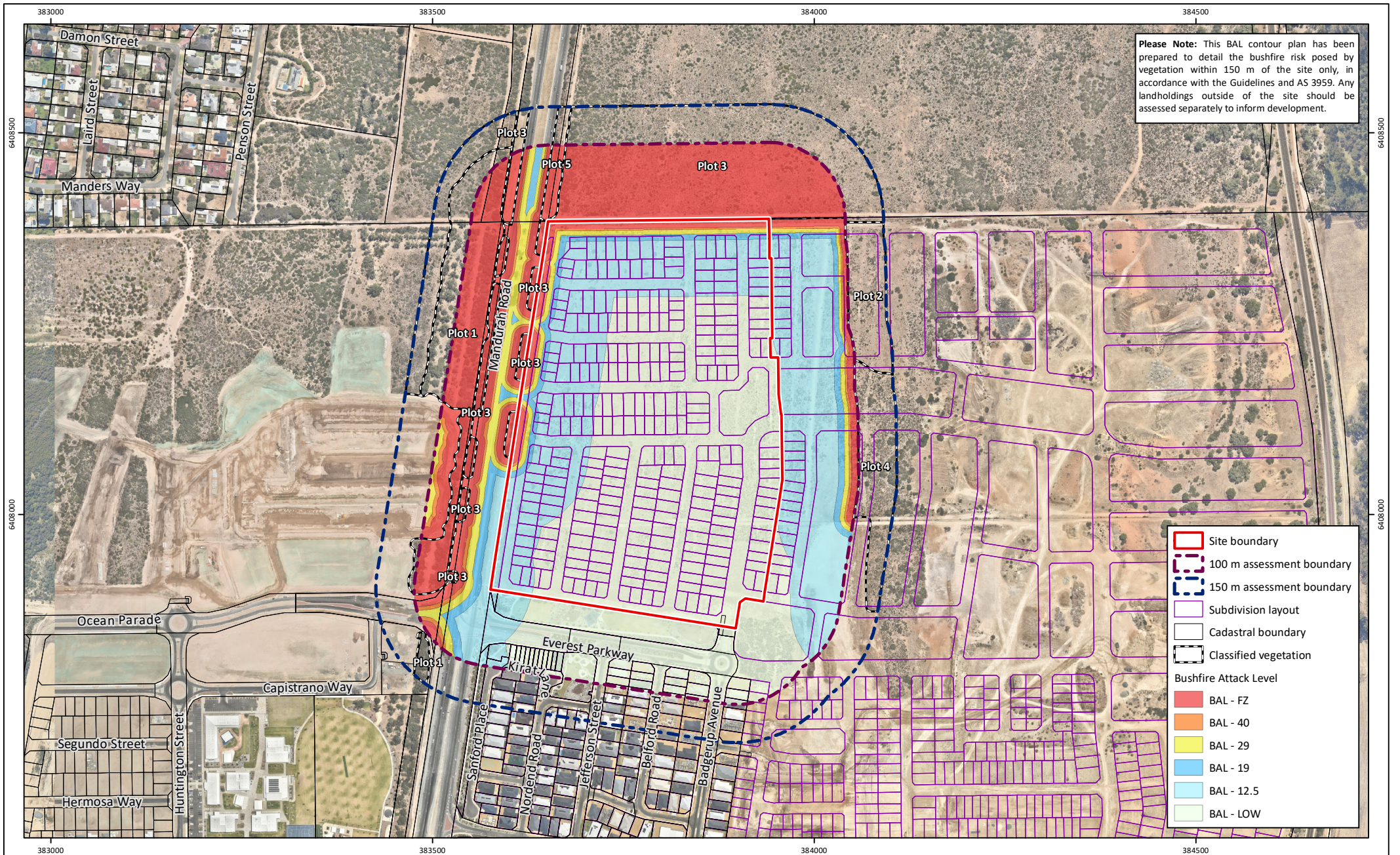
Checked: SPL
Approved: KK
Date: 13/05/2024



Scale: 1:6,500@A4
GDA 1994 MGA Zone 50



While Emerge Associates makes every attempt to ensure the accuracy and completeness of data, Emerge accepts no responsibility for externally sourced data used
©Landgate (2024). Nearmap Imagery date: 31/01/2024

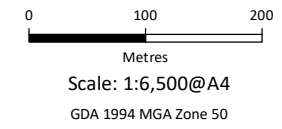


Please Note: This BAL contour plan has been prepared to detail the bushfire risk posed by vegetation within 150 m of the site only, in accordance with the Guidelines and AS 3959. Any landholdings outside of the site should be assessed separately to inform development.

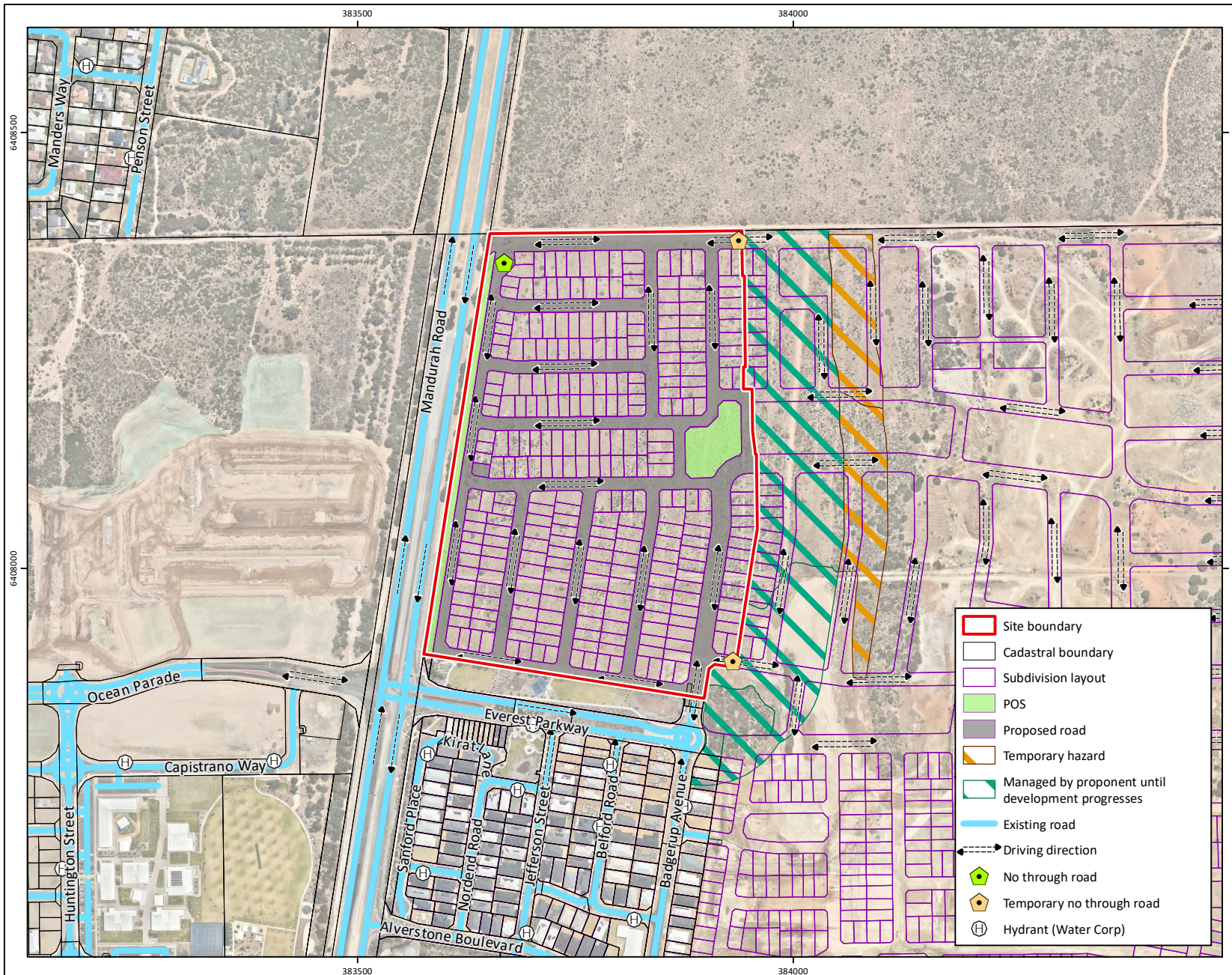
Figure 3: Bushfire Attack Level Contour Plan

Project: Bushfire Management Plan
 Portion 9009 Mandurah Road, Lakelands
Client: Satterley Property Group

Plan Number:
 EP15-019(47)-F182
Drawn: WJC
Date: 19/04/2024
Checked: SPL
Approved: KK
Date: 13/05/2024



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 ©Landgate (2024). Nearmap Imagery date: 31/01/2024



Development Location

All new buildings are to be located in an area that can achieve BAL-29 or less.

Vegetation Management

As part of staged development, the proponent will remove and/or manage vegetation to achieve low threat within 100 m of lots to be titled, or the minimum to ensure BAL-29 is achieved. The proponent will manage these areas until urban development is progressed and the hazard is permanently removed.

Asset Protection Zone

Each lot is required to be managed as an asset protection zone and achieve low threat. The asset protection zone can also include areas of managed public open space and/or road reserve.

Building Construction Requirements

Where designated bushfire prone, Class 1, 2, 3 and associated 10a buildings will need to be constructed in accordance with BAL ratings determined as per AS 3959.

Vehicle Access

- All roads will achieve the public road requirements as per A3.2 of Appendix Four of the Guidelines or as agreed with the City of Mandurah.
- Access to multiple destinations will be provided for each stage of development, unless agreed otherwise with the City of Mandurah. Where required:
 - + Temporary emergency access ways can be used to facilitate access to multiple destinations if the road network is not fully constructed and should achieve the requirements of the Guidelines unless agreed otherwise.
 - + Temporary no through roads are to be provided with a suitable turning area and satisfy the requirements of Appendix Four in the Guidelines.

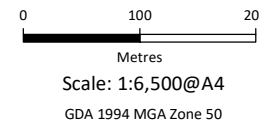
Water Supply

The development will be serviced by a network of reticulated water hydrants.

Figure 4: Spatial Representation of Bushfire Management Strategies

Project: Bushfire Management Plan
Portion 9009 Mandurah Road, Lakelands
Client: Satterley Property Group

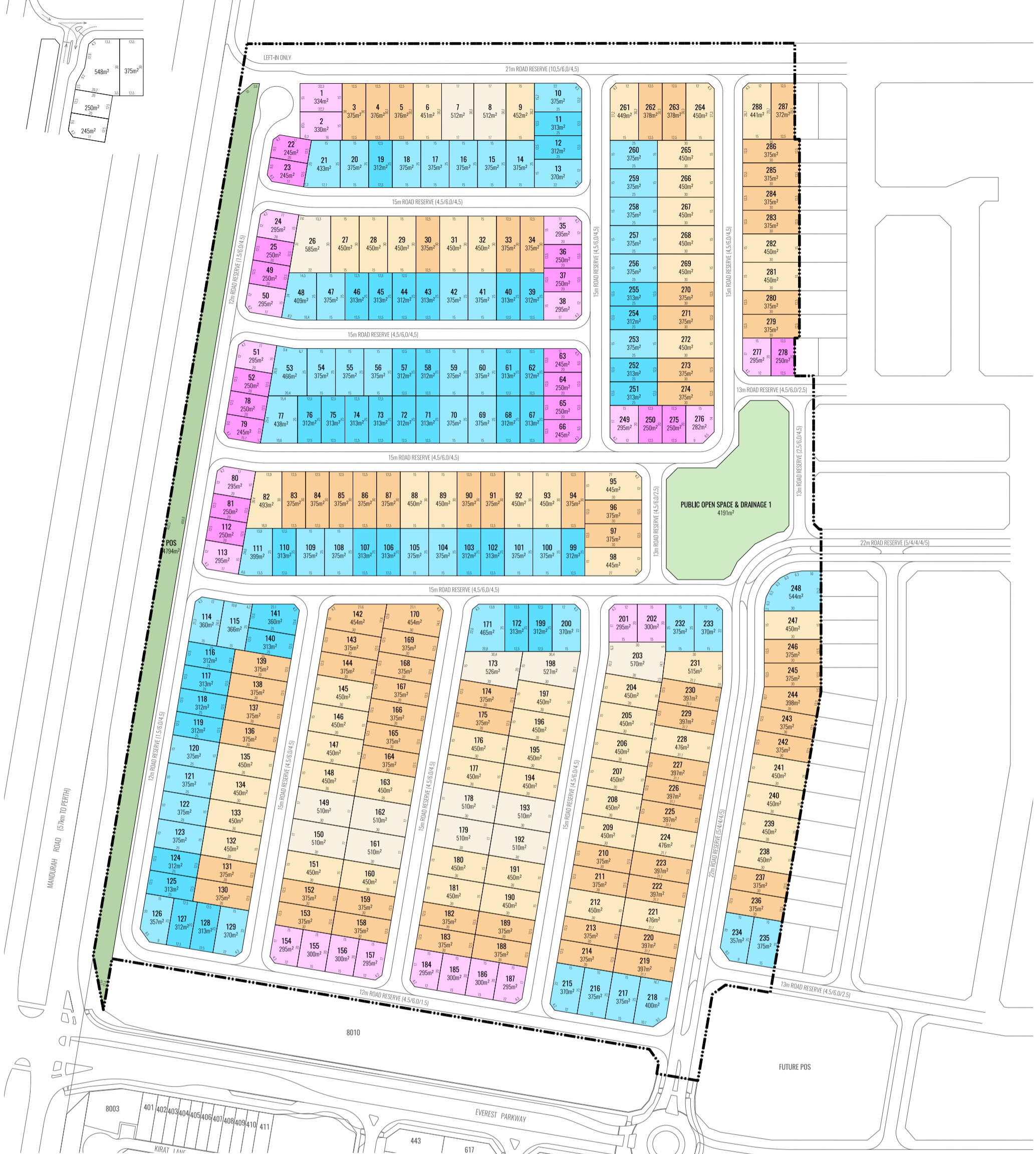
Plan Number:
EP15-019(47)-F183
Drawn: WJC
Date: 22/04/2024
Checked: SPL
Approved: KK
Date: 13/05/2024



Appendix A

Subdivision and Estate Lot Layout and Staging Plan

ENTRY OPTION 2



LEGEND

--- STAGE 13 PROPOSED SUBDIVISION BOUNDARY

RESIDENTIAL LOT SUMMARY

Size	No. Lots	% Total Lots
235m ² - 399m ²	203	70.49%
400m ² - 449m ²	8	2.78%
450m ² - 499m ²	61	21.18%
500m ² - 549m ²	14	4.86%
550m ² - 599m ²	2	0.69%
Total Residential Lots	288	

Minimum Lot Size 245m²
Maximum Lot Size 585m²
Average Lot Size 378m²
Total Lot Area 10,9147ha

LOT TYPOLOGY SUMMARY

Size	No. Lots
12.5 x 20m	18
15 x 20m	22
12.5 x 25m	43
15 x 25m	54
12.5 x 30m	75
15 x 30m	62
17 x 30m	14
Total Residential Lots	288

CONCEPT SUBDIVISION PLAN - STAGE 13+
Ocean Hill Private Estate, LAKELANDS

A CP Land Project

DRAFT

NORTH

Scale: 1:2000 @ A3

0 20 40 60m

PLAN: C/PLDH-1-019 REVISION:
DATE: 06/03/2024 DRAWN: JP
PROJECTION: PCG 94 PLANNER: CM
DATUM: AHD CHECK: JH



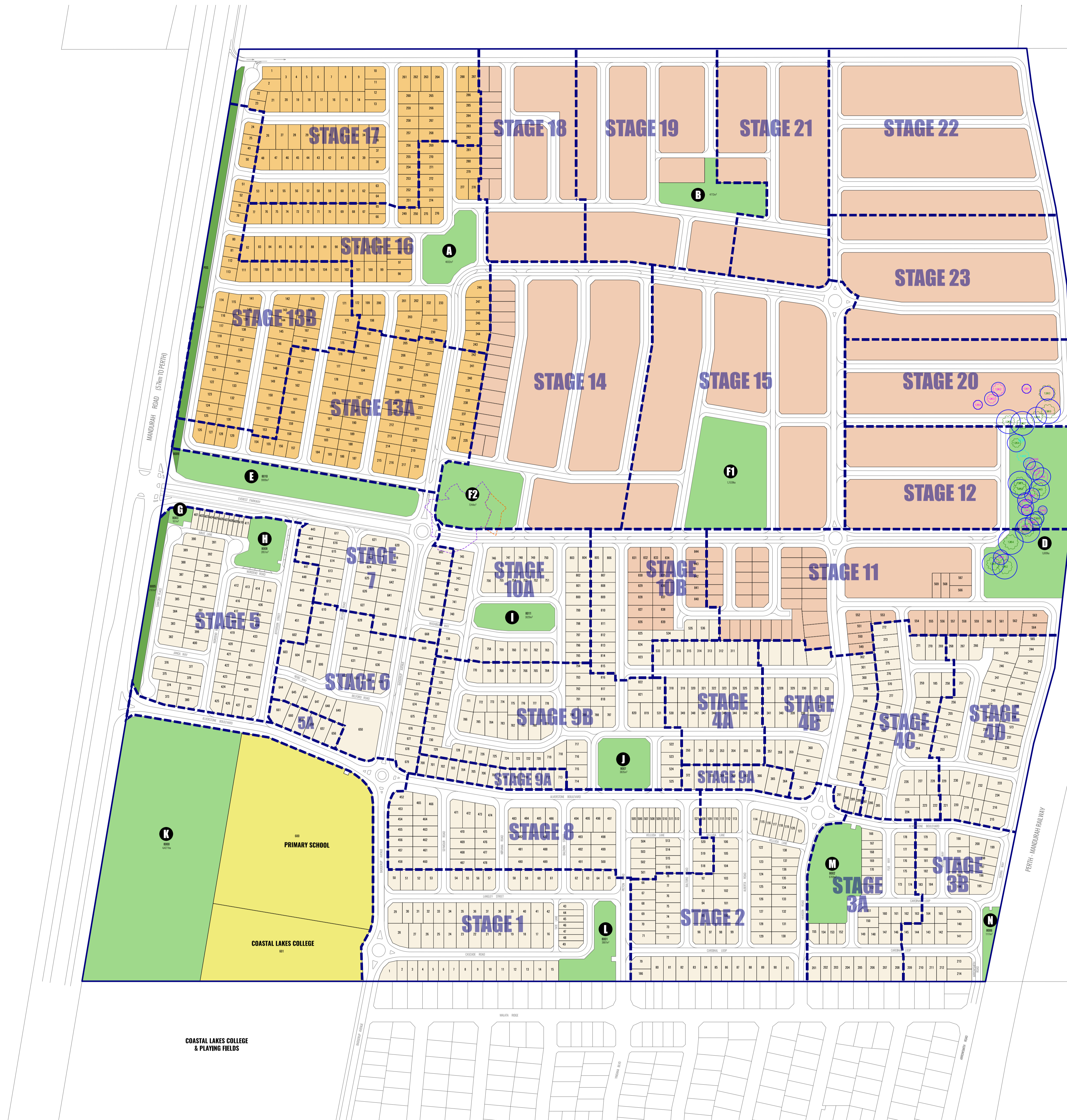
Unit 2, 464 Murray Street
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ESTATE LOT LAYOUT & STAGING PLAN

Ocean Hill Private Estate, LAKELANDS

A CP Land Project



LEGEND

- SUBJECT SITE
- PUBLIC OPEN SPACE
- PUBLIC OPEN SPACE REFERENCE
- EDUCATION
- APPROVED SUBDIVISION AREA (27,568ha)
- PENDING SUBDIVISION AREA (288 LOTS)
- REDESIGN AREA NDA (38,642ha)
- VEGETATION COMMUNITY**
- LARGE EUCALYPTUS FORELAND
- EUCALYPTUS FORELAND POPULATION
- VEGETATION CONDITION**
- LOW RETENTION VALUE
- MEDIUM RETENTION VALUE
- HIGH RETENTION VALUE
- TREE PROTECTION ZONE (TPZ)

