APPENDIX 4:
BUSHFIRE MANAGEMENT PLAN

East Wanneroo – Precinct 7 Structure Plan

Bushfire Management Plan

Date: 8 December 2023

Prepared For: Hesperia

Linfire Ref: 20210511139360ENV-BMP-002_3

Linfire Consultancy

ABN: 577 930 47299

Revision	Issue Date	Revision Description	Approved By
0	4 May 2022	Issued for Approval	Linden Wears (Level 3 BPAD 19809)
1	14 Dec 2022	Amended Rail Reserve	Linden Wears (Level 3 BPAD 19809)
2	28 June 2023	Amended Layout	Linden Wears (Level 3 BPAD 19809)
3	8 Dec 2023	Amended Layout	Linden Wears (Level 3 BPAD 19809)

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1.0 Proposal details

1.1 Background

Hesperia is seeking to lodge a Structure Plan application to guide future subdivision and development across a number of existing lots (the project area), located in the City of Wanneroo. The project area is depicted on the Structure Plan (see Figure 1) and site overview plan (see Figure 2), and proposes to include the following land uses:

- residential cells including a higher density "character area" in the north-eastern part of the project area
- two primary schools and a high school
- Water Corporation infrastructure including groundwater pumping station and waste water pumping stations (WWPS)
- a Special Use area
- areas of Public Open Space (POS) for active, recreation and conservation purposes
- public road layout
- a transport corridor alignment in the eastern part of the project area, including provision for a future railway reserve

1.2 Site description

The project area comprises approximately 420.8 ha across various lots, although it is noted much of this area is within Mariginiup Lake. The project area is surrounded by (see Figure 2):

- existing nurseries and rural lots to the north, some developed and others largely uncleared, with Lakeview Street forming the boundary along the north-east and Little Mariginiup Lake further to the north-east.
- the southern boundary is bordered by Caporn Street, other than a small section in the south-east, with mostly rural-residential lots further south although there is some residential development to the south-west. The rural residential lots are largely developed or previously cleared, however pockets of remnant vegetation remain on some lots. The land south of Caporn Street is identified for future residential development, but will be subject to a separate Structure Plan and the timing of this is uncertain at this stage. The public road network south of Caporn Street is available via Pinjar Road, Garden Park Drive and Franklin Road.
- to the east is mainly rural-residential lots that contain existing development or have been previously cleared, with Jandabup Lake located further to the south-east. Road access to the east is via Townsend Road, with Rousset Road providing access to the north.
- Pinjar Road forms the western boundary of the project area, other than a plot of remnant vegetation retained within Caporn Park to the south-west. Further west of Pinjar Road is mainly existing residential lots.

Mariginiup Lake is centrally located within the project area and development associated with the Structure Plan essentially wraps around the lake. Current land uses within the developed portions of the project area are largely within rural and rural-residential lots, with a variety of agricultural, nurseries and agistment operations, amongst others. A small cluster of existing residential development is located north of Caporn Park, in the western part of the project area.

The majority of the project area is designated as bushfire prone on the *Map of Bush Fire Prone Areas* (DFES 2023; see Plate 1).

1.3 Purpose

This Bushfire Management Plan (BMP) has been prepared to address requirements under *Policy Measure 6.3 of State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015) and *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2021).

1.4 Other plans/reports

There are no known bushfire reports or assessments that have been prepared previously for the project area.

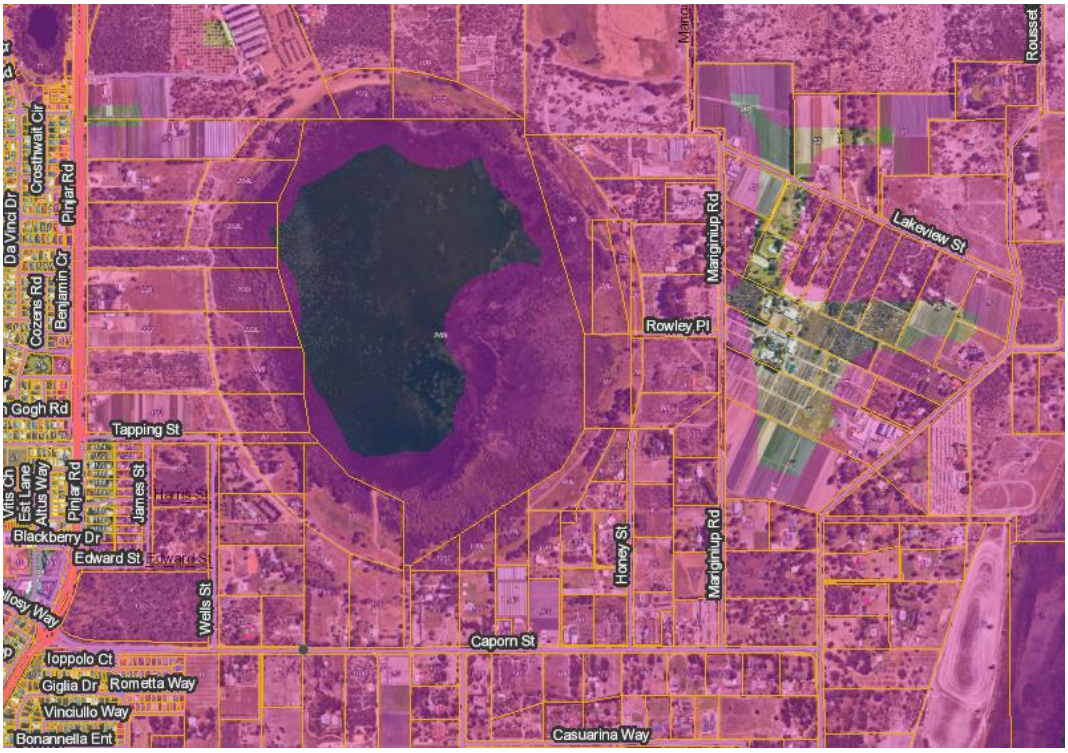


Plate 1: Map of Bush Fire Prone Areas (DFES 2023)

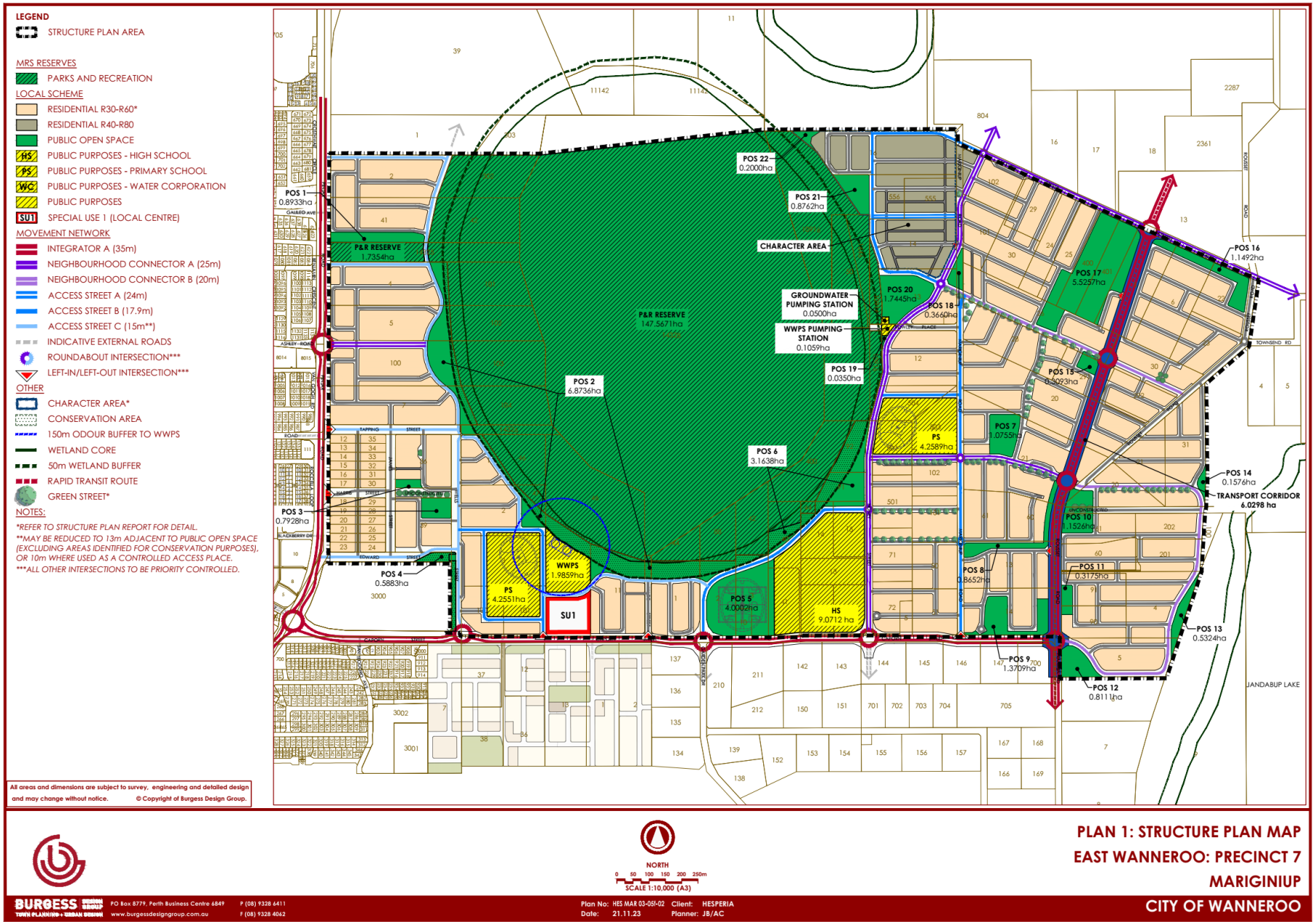
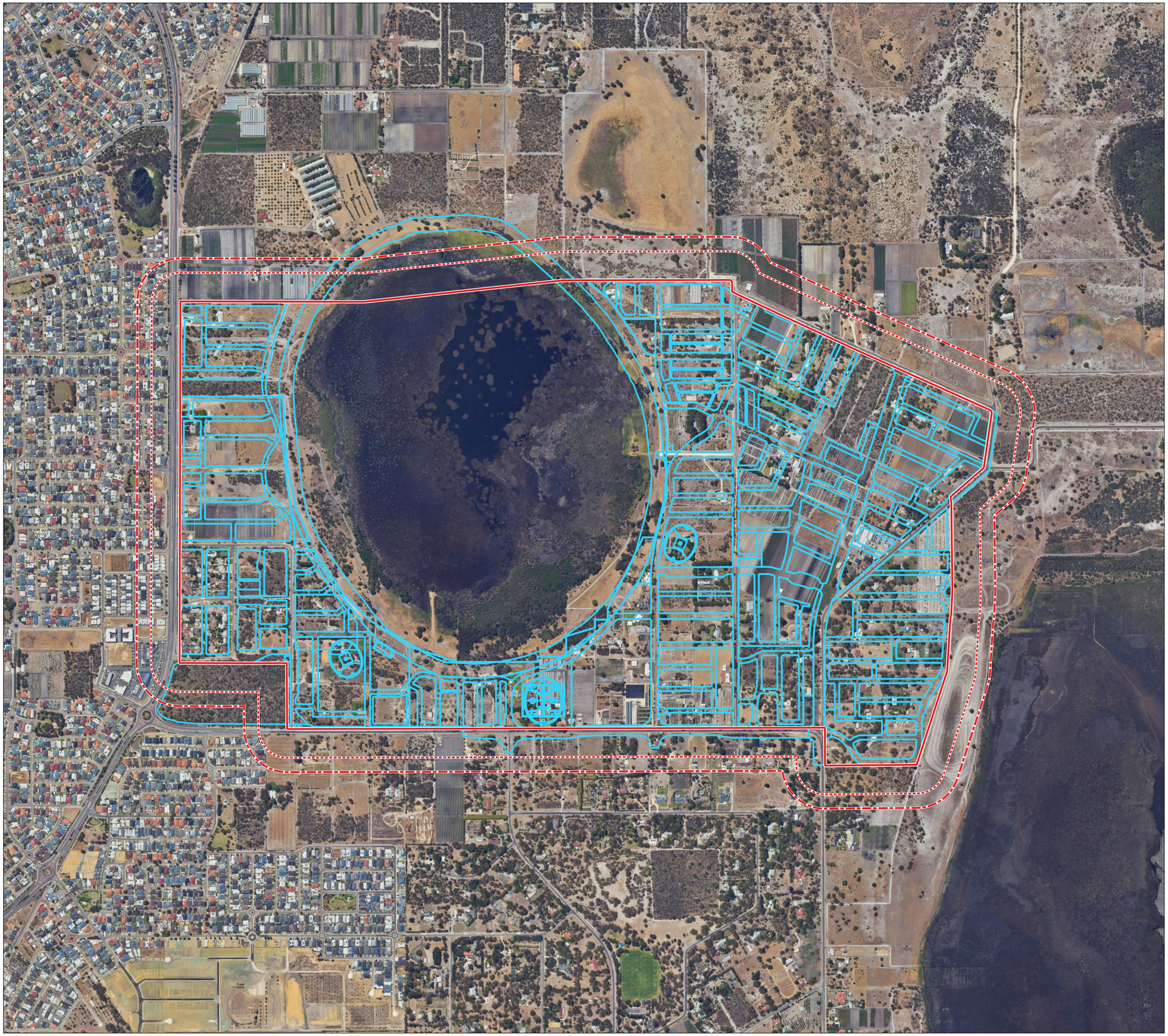


Figure 1: Structure Plan

LINFIRE



Legend

- Project Area
- 100m
- 150m

Scale 1:12,500

0 200 400 600 Metres

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Hesperia

East Wanneroo - Precinct 7 Structure Plan

Figure 2: Site Overview

2.0 Environmental considerations

Regional vegetation surveys and mapping of the Swan Coastal Plain indicates the project area and adjacent land is contained within the following vegetation complexes:

- ***Pinjar Complex***
  - ranges from woodland of Eucalyptus marginata (Jarrah) - Banksia species to a fringing woodland of Eucalyptus rudis (Flooded Gum) - Melaleuca preissiana (Moonah) and sedgelands.
  - Occurs in the central and eastern portions of the project area
- ***Karrakatta Complex – Central and South***
  - predominantly open forest of Eucalyptus gomphocephala (Tuart) - Eucalyptus marginata (Jarrah) - Corymbia calophylla (Marri) and woodland of Eucalyptus marginata (Jarrah) - Banksia species.
  - Occurs in the western part of the project area

2.1 Native vegetation - modification and clearing

The majority of the project area contains remnant vegetation, which will be cleared as part of the proposal other than the CCW and buffer surrounding Mariginiup Lake and various POS areas within the development. Table 1 provides a summary of a search of publicly available environmental data.

Linfire assumes that all relevant environmental studies will be undertaken to support the project, and if any State and Federal environmental and heritage referrals and approvals are required, they will be sought prior to commencing on-site works.

Table 1: Summary of environmental values

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
Environmentally Sensitive Area		✓	✓	There are several parts of the project area and adjacent land, identified as Environmentally Sensitive Areas, namely: • Mariginiup Lake, Little Mariginiup Lake (and the land between them) • Lot 14325 on Plan 28391 (240 Pinjar Rd; Crown Reserve 46711) • Caporn Park • Jandabup Lake and surrounds
Swan Bioplan Regionally Significant Natural Area	✓			No Regionally Significant Natural Areas were identified.
Ecological linkages	N/A	N/A	N/A	This layer not available at the time of document preparation. Additional studies may be required to assess.
Wetlands		✓	✓	Mariginiup Lake, Little Mariginiup Lake and Jandabup Lake are identified as Conservation wetlands, with the northern and western shore of Jandabup Lake

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
				nominated as Multiple Use wetlands. No Ramsar sites are mapped as occurring within or adjacent to the project area.
Waterways		✓	✓	The main waterway in the project area is Mariginiup Lake with Little Mariginiup Lake and Jandabup Lake located adjacent to the project site.
Threatened Ecological Communities listed under the EPBC Act			✓	No Threatened Ecological Communities were identified within or adjacent to the project area. A Tuart Woodlands community is identified to the south of the project area, within rural residential lots to the south-west of Edgar Griffiths Park.
Threatened and priority flora	N/A	N/A	N/A	This layer not available at the time of document preparation, however this is addressed in the project Environmental Assessment Report.
Fauna habitat listed under the EPBC Act		✓	✓	The project area has no confirmed Carnaby's Cockatoo roost sites but does have unconfirmed roost sites in the south-east of the site in addition to roosting sites for Black Cockatoos. Numerous sites are identified as requiring investigation as feeding habitat for Carnaby's Cockatoo The project area shows no suitability for Western Ringtail Possum habitat.
Threatened and priority fauna	N/A	N/A	N/A	This layer not available at the time of document preparation, however this is addressed in the project Environmental Assessment Report
Bush Forever Site		✓	✓	The following protected Bush Forever sites have been identified within the project area and surrounding land: • Mariginiup Lake, Little Mariginiup Lake and the land between them (Bush Forever Site 147) • Caporn Park (Bush Forever Site 469) • Jandabup Lake and surrounds (Bush Forever Site 324) • Small plot in Edgar Griffiths Park (Bush Forever Site 470)
DBCA managed lands and waters (includes legislated lands and	✓			No DBCA managed or legislated land and waters were identified within or adjacent to the project area.

Environmental value	Not mapped as occurring within or adjacent to the project area	Mapped as occurring within or adjacent to the project area		Description
		Within	Adjacent	
waters and lands of interest)				The nearest is Jandabup Lake to the east which is nominated as a Nature Park under the DBCA legislated land and waters
Conservation covenants	✓			No information has been provided by the client regarding Conservation Covenants.
Conservation covenants		✓	✓	Several Crown Reserves have been identified within the project area including: • R 46711 (Lot 14325 on Plan 28391; 240 Pinjar Rd) • R 39895 (Lot 10916 on Plan 15011; 26 Rowley Place) The following Crown Reserves have been identified adjacent to the project area: • R 26452 (Caporn Park; 120 Pinjar Rd) • R 40696 (Northern extent of Mariginiup Lake; 100 Ranch Rd) • R 48073 (42 San Teodoro Ave) • R 36601 (Edgar Griffiths Park) • R 7349 (Jandabup Lake and surrounds)
Aboriginal Heritage		✓	✓	The project area contains a registered Aboriginal Heritage site within Mariginiup Lake (Registered Site Number 3741). To the north-east of the project area, land has been mapped as Other Heritage Place (Place ID 22160). Separate approval will need to be sought to address Aboriginal heritage significance.

2.2 Revegetation / Landscaping

Significant vegetation retention within the project area, and rehabilitation or revegetation where required, is expected to be limited to the proposed conservation POS and Parks and Recreation areas (including within the wetland buffers and regional ecological linkages) in addition to some future drainage areas. Where possible, minor vegetation retention will also be proposed in managed landscapes such as POS areas, school ovals and road reserves. The Concept Landscape Plan (refer to Appendix 1) provides an indicative visual guide of POS areas which are expected to comprise a combination of retained native vegetation and low threat landscaping within passive and active POS. While this BMP has represented the proposed post-development conditions as much as possible against the Concept Landscape Plan, the full extent of native vegetation retention and rehabilitation within the project area will be determined at future planning stages through the allocation of POS and the development of detailed landscaping plans.

Pre-development mapping depicting the current vegetation classifications and extent, is provided in

Section 3.1, with the anticipated post-development vegetation classifications following completion of the development, identified in Section 3.1.4. Within POS areas, where vegetation is likely to be retained, the BMP assumes that where any areas of substantial tree retention is proposed, that areas of existing Class A forest or Class D scrub will remain as they currently present, however areas of Class B woodland have been assumed to become Class A forest without understorey management. All other vegetation within the POS areas has typically been excluded as low threat vegetation on the basis that anything other the forest and scrub will be managed, other than drainage basins which will be Class C shrubland.

Existing forest, scrub and shrubland vegetation fringing Mariginiup Lake has been assumed to remain as it currently presents, and drainage basins will be Class C shrubland. All grassland has been assumed to be revegetated to Class C shrubland, which will also result in areas of Class B woodland becoming Class A forest with the increased understorey fuels. The only area of additional management is the portion of the forest to the north-west of the proposed high school, which is to be established as a parkland managed landscape (i.e. existing trees retained but underpruned where required, and with high-level of understorey management), such that they can be excluded as low threat vegetation and avoid onerous BAL impacts on future school buildings.

Should any retained vegetation or revegetation not be excluded from classification in accordance with any of the exclusions nominated under AS 3959 Clause 2.2.3.2, sufficient separation will be created between the classified vegetation and proposed habitable development to ensure any BAL impact is limited to BAL-29 or less.

Outside of the POS areas, any future landscaping within residential areas, the three schools, the Water Corporation infrastructure and the Special Use area, will likely consist of low threat and managed gardens and street scaping in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines (refer to Appendix 3) as depicted on the Concept Landscaping Plan.

3.0 Bushfire assessment results

3.1 Assessment inputs

3.1.1 Vegetation classification

Linfire assessed classified vegetation and exclusions within 150 m of the project area through on-ground verification on 21 and 22 May 2021 in accordance with *AS 3959—2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018) and the *Visual Guide for Bushfire Risk Assessment in Western Australia* (DoP 2016). Georeferenced site photos and a description of the vegetation classifications and exclusions are contained in Appendix 2 and depicted in Figure 3 and Figure 5.

It is noted that a bushfire has very recently occurred within much of the project area, and as such, much of the existing vegetation observed during the site inspection, has likely be burned. While this may have altered the vegetation currently onsite, the vegetation classification presented for pre-development conditions is considered appropriate for the mature vegetation state required for the BHL assessment.

A summary of the assessed classified vegetation that is expected to remain following development works is as follows:

- Class A forest
    - Occurs as multi-layered vegetation structure with shrubby understorey and mature trees > 6 m in height.
    - Occurs as significant plots fringing Mariniguip Lake, within Caporn Park and south of Lakeview Street, with other isolated smaller plots throughout the project area.
    - In the post-development scenario, it includes the conversion of woodland to forest, resulting from the increase in understorey vegetation from potential future revegetation.
- Class B woodland
    - Areas of mature tree >6 m height, with grassy or very low shrub understorey
    - Typically occurs where previously clearing and current grazing and horse agistment, within existing lots has removed much of the native understorey vegetation.
    - In the post-development scenario, woodland within the project area is assumed to be converted to forest, with the increase in understorey vegetation from potential future revegetation.
- Class C shrubland
    - Vegetation <2 m high, with any trees >6m high forming <10% of the canopy cover.
    - In the post-development scenario
        - shrubland revegetation of the wetland and buffer has been assumed, replacing existing grassland, although it is expected this will be further refined at future planning stages.
        - all indicative drainage basins are assumed to be revegetated with shrubland biofiltration vegetation.
        - where POS areas, any shrubland is typically in discrete plots and is assumed to be managed in low threat gardens, other than where it occur within any drainage basins.

- Class D scrub
    - Typically areas of banksia woodland with predominant vegetation <6 m high
    - any emergent trees >6m high forming <10% of the canopy cover.
    - In the post-development scenario, all scrub vegetation remains as per the pre-vegetation state.
- Class G grassland
    - Unmanaged grass >100 m in height, with any trees >6m high forming <10% of the canopy cover.
    - In the post-development scenario, all grassland within the wetland and buffer is assumed to be revegetated to shrubland vegetation, including within areas of woodland vegetation.

A summary of the assessed exclusions are as follows:

- Clause 2.2.3.2 (a) plots of unmanaged vegetation further than 100 m from the project area
- Clause 2.2.3.2 (e) areas of non-vegetated land such as land cleared for existing and proposed roads, infrastructure and buildings
- Clause 2.2.3.2 (f) land managed in a minimal fuel low threat condition, such as road verges, managed gardens and lawns including the managed POS areas.
    - There are significant areas of agricultural land and commercial nurseries and orchards that have been excluded under this clause, with some appearing less managed than others. These will need to be reviewed in detail as part of future planning applications to ensure that the level of management is sufficient to warrant exclusion at the time of application.
    - In the post-development scenario, this has been applied to areas where it is considered likely vegetation will be managed within POS areas and areas along the main walking path and active play areas around the wetland.
- Clause 2.2.3.2 (b) isolated plots of unmanaged vegetation, likely within the proposed POS areas that will be less than 1 ha and will be located so it is further than 100 m from any other classified vegetation
- Clause 2.2.3.2 (c) isolated plots of unmanaged vegetation, likely within the proposed POS areas that will be less than 2500 m^2 and will be located so it is further than 20 m from any proposed lots or any other classified vegetation
- Clause 2.2.3.2 (d) isolated plots of unmanaged vegetation, likely within the proposed POS areas that will be less than 20 m wide and will be located so it is further than 20 m from any proposed lots or any other classified vegetation

Exclusions under Clauses 2.2.3.2 (a), (c) and (d) are most likely be used to exclude retained vegetation within certain proposed POS and drainage areas, with Clauses 2.2.3.2 (e) and (f) used for all non-vegetated elements and managed vegetation proposed as part of the development.

3.1.2 Effective slope

Linfire assessed effective slope under classified vegetation through on-ground verification on 21 and 22 May 2021 in accordance with AS 3959. Results were cross-referenced with Landgate 5m contour data and are depicted in Table 2, Table 3 and Figures 3 to 6.

3.1.3 *Pre-development inputs*

A summary of the assessed pre-development classified vegetation, exclusions and effective slope within the project area, and the adjacent 150 m, are listed in Table 2 and illustrated in Figures 3 and 4.

Table 2: Pre-development vegetation classifications/exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class G Grassland	Flat/upslope (0°)	Fringing parts of Mariginiup Lake and throughout some existing rural residential lots
2	Class G Grassland	Downslope >0–5°	
3	Class D Scrub	Flat/upslope (0°)	Occurring as large plots within Mariginiup Lake and within the assessment area often as banksia woodland
4	Class D Scrub	Downslope >0–5°	
5	Class C Shrubland	Flat/upslope (0°)	Occurs as a large plot centrally within Mariginiup Lake and within the assessment area as isolated plots
6	Class C Shrubland	Downslope >0–5°	
7	Class A Forest	Flat/upslope (0°)	Occurring as large plots fringing the west and south of Mariginiup Lake, and within the assessment area as discrete plots, especially south of Lakeview Street and within Caporn Park
8	Class A Forest	Downslope >0–5°	
9	Class B Woodland	Flat/upslope (0°)	Occurs mainly within existing rural residential lots, where clearing and grazing has removed understorey vegetation from beneath mature trees
10	Class B Woodland	Downslope >0–5°	
11	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Existing buildings, roads, verges, managed gardens, maintained POS, commercial nurseries
12	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	Areas of cleared land.
13	Excluded – Clause 2.2.3.2 [a]	N/A	Unmanaged vegetation that is further than 100 m from the project area

3.1.4 *Post-development inputs*

A summary of the potential post-development classified vegetation, exclusions and effective slope within the project area, and the adjacent 150 m, are listed in Table 3 and illustrated in Figures 5 and 6.

The post-development vegetation classifications for all land external to the project area has remained the same as for the pre-development classifications. It is understood that residential development is proposed to the south of Caporn Street, however as the timing is not certain, this has not been reflected in the post-development mapping. If external vegetation is altered prior to future planning stages, the change in vegetation condition is to be captured through a future BHL assessment or BAL contour map assessment.

Within the project area, the post-development vegetation classifications have been derived from the treatments proposed in the concept landscaping plan as follows:

- CCW revegetation
    - Occurs within the wetland and buffer, and while exact specifications aren't yet determined, and will be addressed as part of future planning stages, this BMP has assumed that all Class G grassland will be revegetated to Class C shrubland, and this will also result in areas of Class B woodland becoming Class A forest.
    - The only exception to existing forest being retained as it currently presents, is the portion of the forest to the north-west of the proposed high school, which is to be modified to a parkland managed landscape (i.e. existing trees retained but underpruned where required, and with high-level of understorey management), such that it can be excluded as low threat vegetation and avoid onerous BAL impacts on future school buildings.
- Shrub planting
    - Is expected to contain species that are 1 m to 1.5m high at maturity
    - This BMP assumes that:
        - Where located in POS areas or along the main walking path (around the wetland), the shrub plantings will be subject to ongoing management, and as such, have been excluded from classification.
        - Where located outside POS areas and in more bulk areas around the wetland, the level of management may not be possible, and has been classified as Class C shrubland
- Basin vegetation
    - Understood to be low groundcovers with intermittent trees, will be further defined as part of future planning stages.
    - This BMP has assumed that all Class G grassland will be revegetated to Class C shrubland, and this will also result in areas of Class B woodland becoming Class A forest.
- Drainage basin/swale planting
    - Likely to be biofiltration vegetation (e.g. sedges and reeds), typically less than 2 m high
    - Has been assigned a Class C shrubland classification.
- Low fuel planting
    - Assumed to be low threat vegetation, and excludable as per AS 3959 Clause 2.2.3.2 (f)
    - Will be managed on an ongoing basis, in perpetuity.
- Turf and Mulch Only
    - Assumed to be either managed lawn or mulch and excluded as per AS 3959 Clause 2.2.3.2 (f).

Where vegetation is likely to be retained within POS areas, the BMP assumes that where any areas of substantial tree retention is proposed, that areas of existing Class A forest or Class D scrub will remain as they currently present, however areas of Class B woodland will revert to Class A forest without the ongoing management.

While the Concept Landscaping Plan provides an indicative approach for vegetation fringing Mariginiup Lake, it is noted this is conceptual and could be subject to further works at future planning stages which may refine the landscaping and revegetation requirements of the wetland and buffer. Any proposed revegetation along this interface is to ensure sufficient separation is provided so that

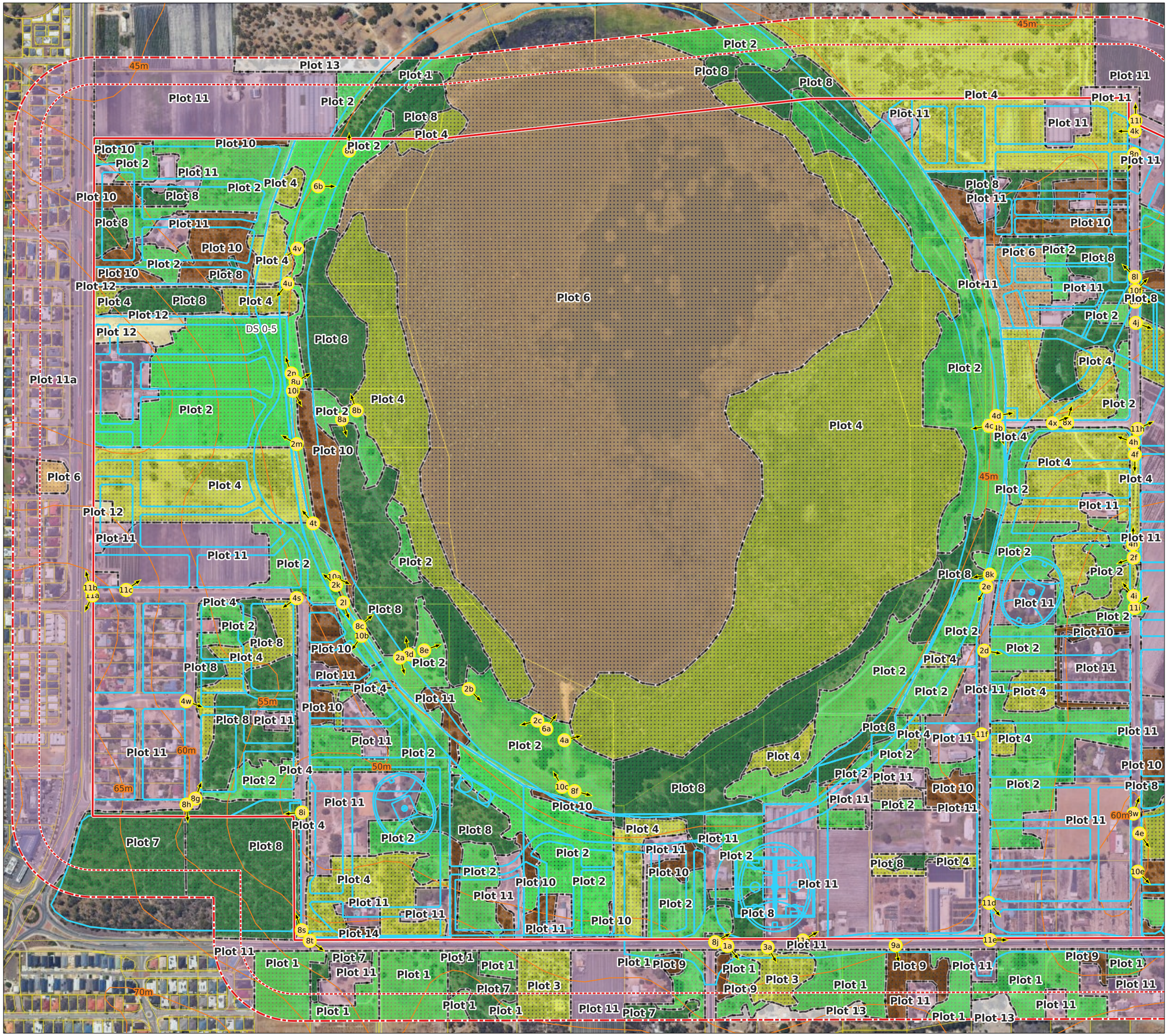
any BAL impact is limited to BAL-29 or less, however should any retained vegetation or revegetation be excludable in accordance with any of the exclusions nominated under AS 3959 Clause 2.2.3.2, this is to be captured through a future BHL assessment or BAL contour map assessment.

Outside of the POS areas, any future landscaping within residential areas, the three schools, the Water Corporation infrastructure and the Special Use area, will likely consist of low threat and managed gardens and street scaping in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines (refer to Appendix 3) as depicted on the Concept Landscaping Plan.

Table 3: Post-development vegetation classifications/exclusions and effective slope

Vegetation plot	Vegetation classification	Effective slope	Comments
1	Class G Grassland	Flat/upslope (0°)	Occurs primarily throughout some existing rural residential lots south of Caporn Street as well as north and east of the project area. Pre-development grassland, especially fringing Mariginiup Lake, is assumed to be revegetated to Class C shrubland.
2	Class G Grassland	Downslope >0–5°	
3	Class D Scrub	Flat/upslope (0°)	Occurring as large plots within Mariginiup Lake and within the assessment area often as banksia woodland.
4	Class D Scrub	Downslope >0–5°	
5	Class C Shrubland	Flat/upslope (0°)	Occurs mainly as a large plot centrally within Mariginiup Lake and within the assessment area as isolated plots The existing grassland fringing the wetland and within the buffer, are assumed to be revegetated to shrubland vegetation. Future drainage basins are assumed to be shrubland biofiltration vegetation.
6	Class C Shrubland	Downslope >0–5°	
7	Class A Forest	Flat/upslope (0°)	Occurring as large plots fringing the west and south of Mariginiup Lake. Areas of existing woodland within the project area, that are to be retained post-development (e.g. within POS areas and the wetland and buffer), are also assumed to become Class A forest due to understorey planting. Existing woodland vegetation outside the project area, but within the assessment area, occurs as discrete plots, especially south of Lakeview Street and within Caporn Park.
8	Class A Forest	Downslope >0–5°	
9	Class B Woodland	Flat/upslope (0°)	Occurs outside the project area in existing rural residential lots, where clearing and grazing has removed understorey vegetation from beneath mature trees. A number of plots are also identified to the south of the project area.
10	Class B Woodland	Downslope >0–5°	
11	Excluded – Non-vegetated	N/A	Existing buildings, roads, verges,

Vegetation plot	Vegetation classification	Effective slope	Comments
	and Low threat (Clause 2.2.3.2 [e] and [f])		managed gardens, maintained POS, commercial nurseries, outside the project area.
12	Excluded – Non-vegetated (Clause 2.2.3.2 [e])	N/A	Areas of cleared land.
13	Excluded – Clause 2.2.3.2 [a]	N/A	Unmanaged vegetation that is further than 100 m from the project area
14	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])	N/A	Land that upon completion of development, will be non-vegetated elements or low threat vegetation. This includes the managed areas within nominated POS areas, and areas along the main walking path and active play areas around the wetland.



Legend

- Photo Location
- Contours
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

Classified Vegetation

- A. Forest
- B. Woodland
- C. Shrubland
- D. Scrub
- G. Grassland
- Excluded Clause 2.2.3.2(a)
- Excluded Clause 2.2.3.2(e)
- Excluded Clause 2.2.3.2(e&f)

Scale 1:6,700

0 100 200 300 Metres

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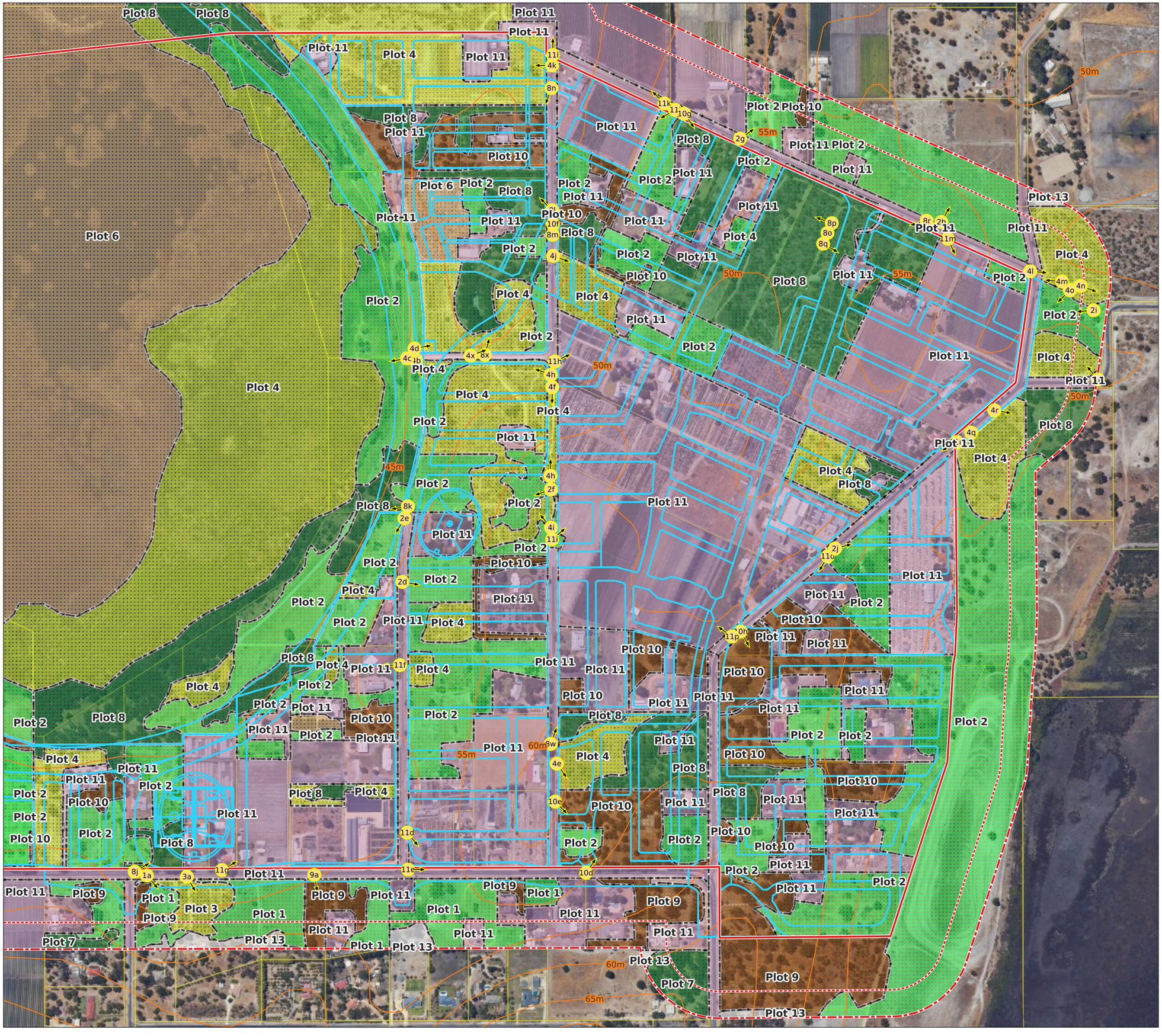
Hesperia

East Wanneroo - Precinct 7 Structure Plan

Figure 3: Pre-development Vegetation and Effective Slope (West)



Legend

- Photo Location
- Contours
- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

Classified Vegetation

- A. Forest
- B. Woodland
- C. Shrubland
- D. Scrub
- G. Grassland
- Excluded Clause 2.2.3.2(a)
- Excluded Clause 2.2.3.2(e&f)

Scale 1:6,700

0 100 200 300 Metres

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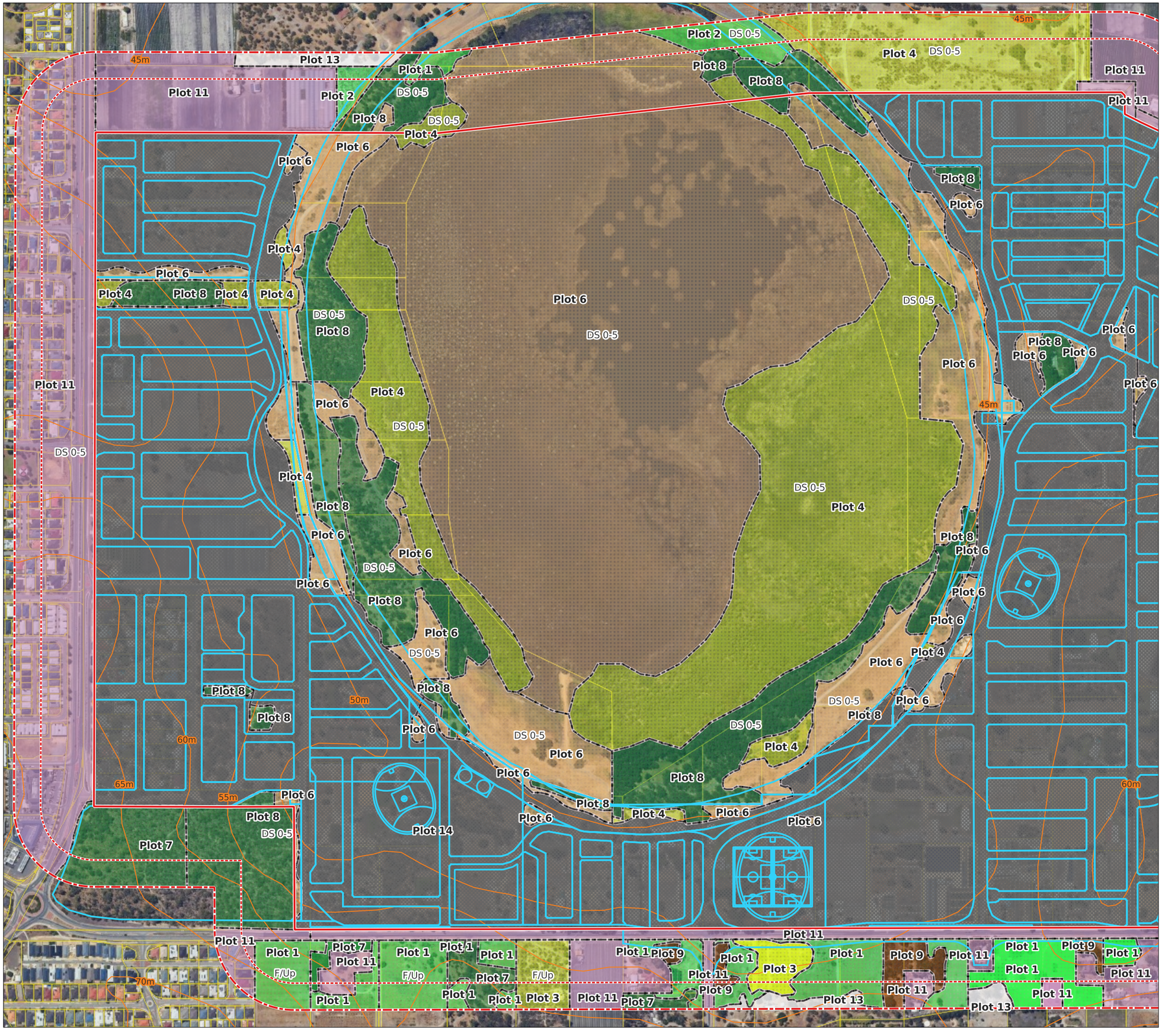
Figure 4: Pre-development Vegetation and Effective Slope (East)



Legend

- Proposed Development
- Contours
- Project Area

Assessment Area

- 100m
- 150m
- Vegetation Plot

Classified Vegetation

- A. Forest
- B. Woodland
- C. Shrubland
- D. Scrub
- G. Grassland
- Excluded Clause 2.2.3.2(a)
- Excluded Clause 2.2.3.2(e&f)
- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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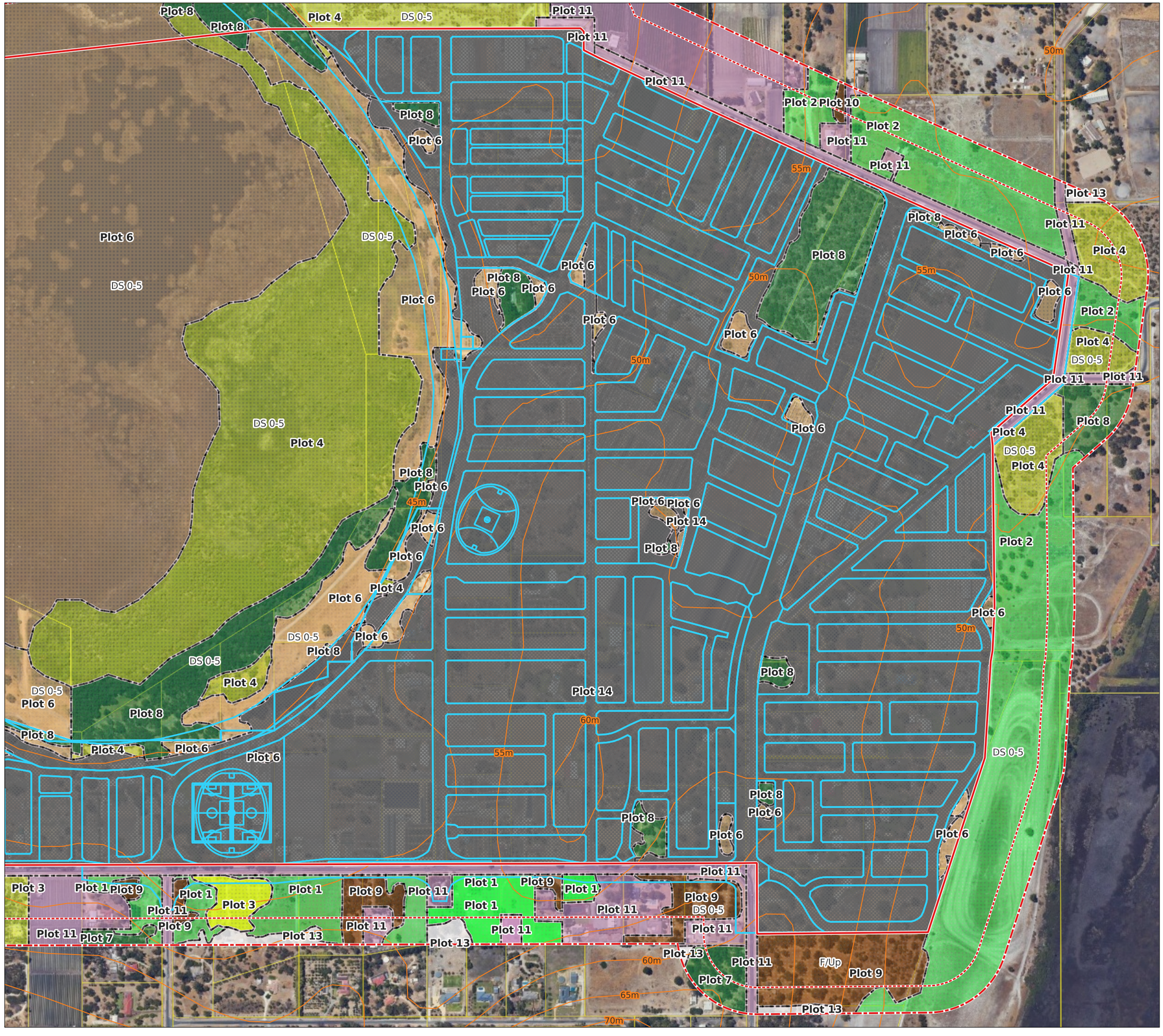
Figure 5: Post-development vegetation and effective slope (West)



Legend

- Proposed Development
- Contours
- Project Area

Assessment Area

- 100m
- 150m
- Vegetation Plot

Classified Vegetation

- A. Forest
- B. Woodland
- C. Shrubland
- D. Scrub
- G. Grassland
- Excluded Clause 2.2.3.2(a)
- Excluded Clause 2.2.3.2(e&f)
- Modified to non vegetated and low threat

Scale 1:6,700

0 100 200 300 Metres

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Figure 6: Post-development vegetation and effective slope (East)

3.2 Assessment outputs

3.2.1 Bushfire Hazard Level (BHL) assessment

Pre- and post-development vegetation extents have been assigned a bushfire hazard level in accordance with the methodology detailed in Appendix Two of the Guidelines as outlined in Table 4.

Table 4: Bushfire hazard levels and characteristics

Bushfire hazard level	Characteristics*
Extreme	• Class A Forest • Class B Woodland (05) • Class D Scrub • Any classified vegetation with a greater than 10° slope.
Moderate	• Class B Low woodland (07) • Class C Shrubland • Class E Mallee/Mulga • Class G Grassland, including sown pasture and crops • Class G Grassland: Open woodland (06), Low open woodland (08), Open shrubland (09) • Vegetation that has a low hazard level but is within 100 metres of vegetation classified as a moderate or extreme hazard, is to adopt a moderate hazard level.
Low	• Low threat vegetation may include areas of maintained lawns, golf courses, public recreation reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks • Managed grassland in a minimal fuel condition (insufficient fuel is available to significantly increase the severity of the bushfire attack). For example, short-cropped grass to a nominal height of 100 millimetre • Non-vegetated areas including waterways, roads, footpaths, buildings and rock outcrops.

*Vegetation classifications from AS 3959-2018 Table 2.3.

3.2.1.1 Pre-development

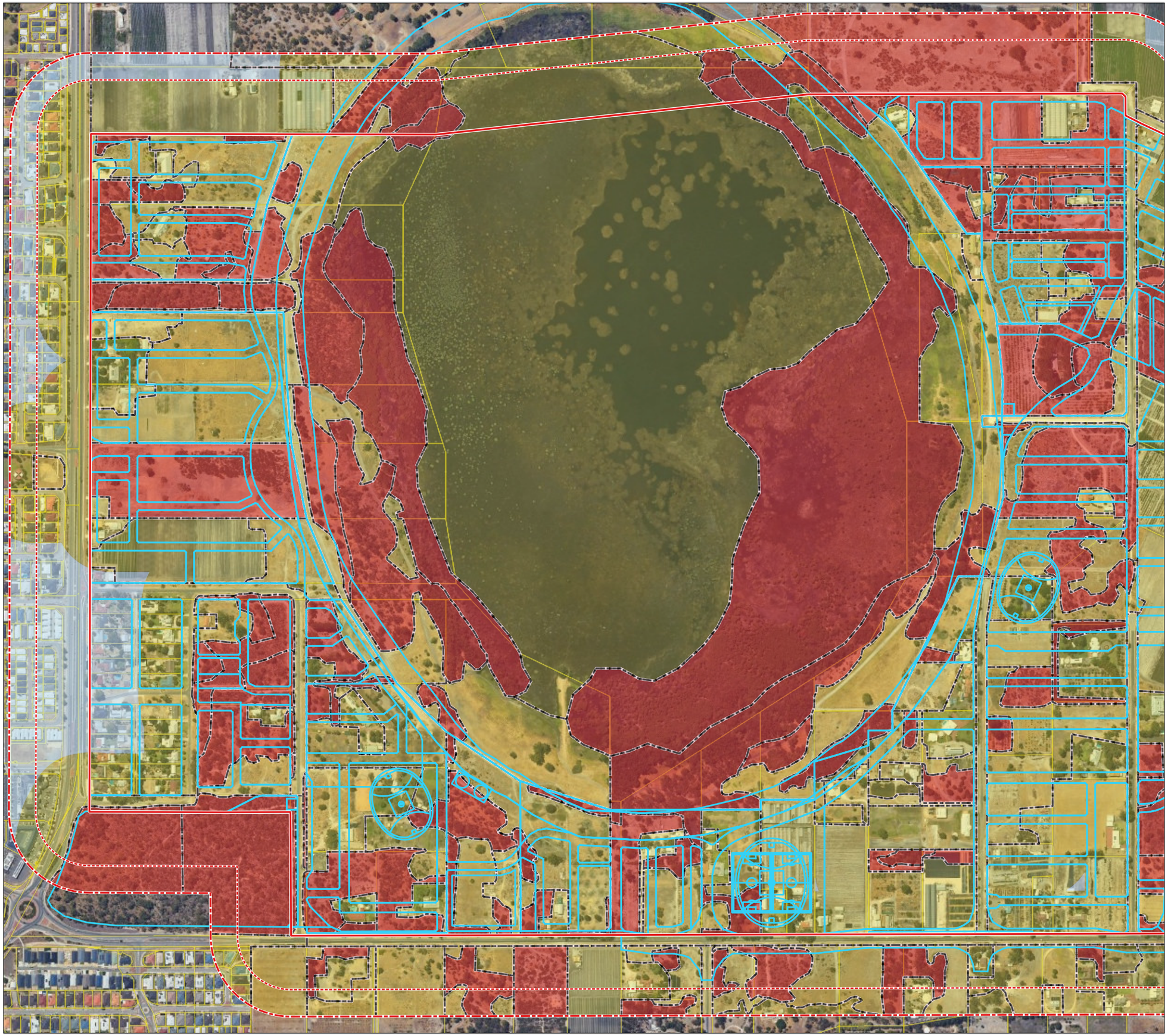
Linfire has mapped the pre-development bushfire hazard levels within the project area and adjacent 150 m wide assessment area. The bushfire hazard levels have been assessed on the basis of the vegetation discussed in Section 3.1.3 (i.e. the current pre-development extent of vegetation within, and surrounding, the project area).

The pre-development BHL assessment (refer to Figures 7 and 8) show that based on the existing vegetation, the project area contains land with Low, Moderate and Extreme bushfire hazard levels.

3.2.1.2 Post-development

Linfire has mapped the potential post-development bushfire hazard levels to demonstrate that the future bushfire hazard levels will be acceptable for future development to occur within the project area. The bushfire hazard levels have been assigned on the basis of the vegetation discussed in Section 3.1.4 and the future expected vegetation extent within and surrounding the project area.

The post-development BHL assessment (refer to Figures 9 and 10) demonstrate that all future habitable development (e..g residential, commercial, schools etc) will be located on land with either a Low or Moderate bushfire hazard level.



Legend

- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale 1:6,700

0 100 200 300 Metres

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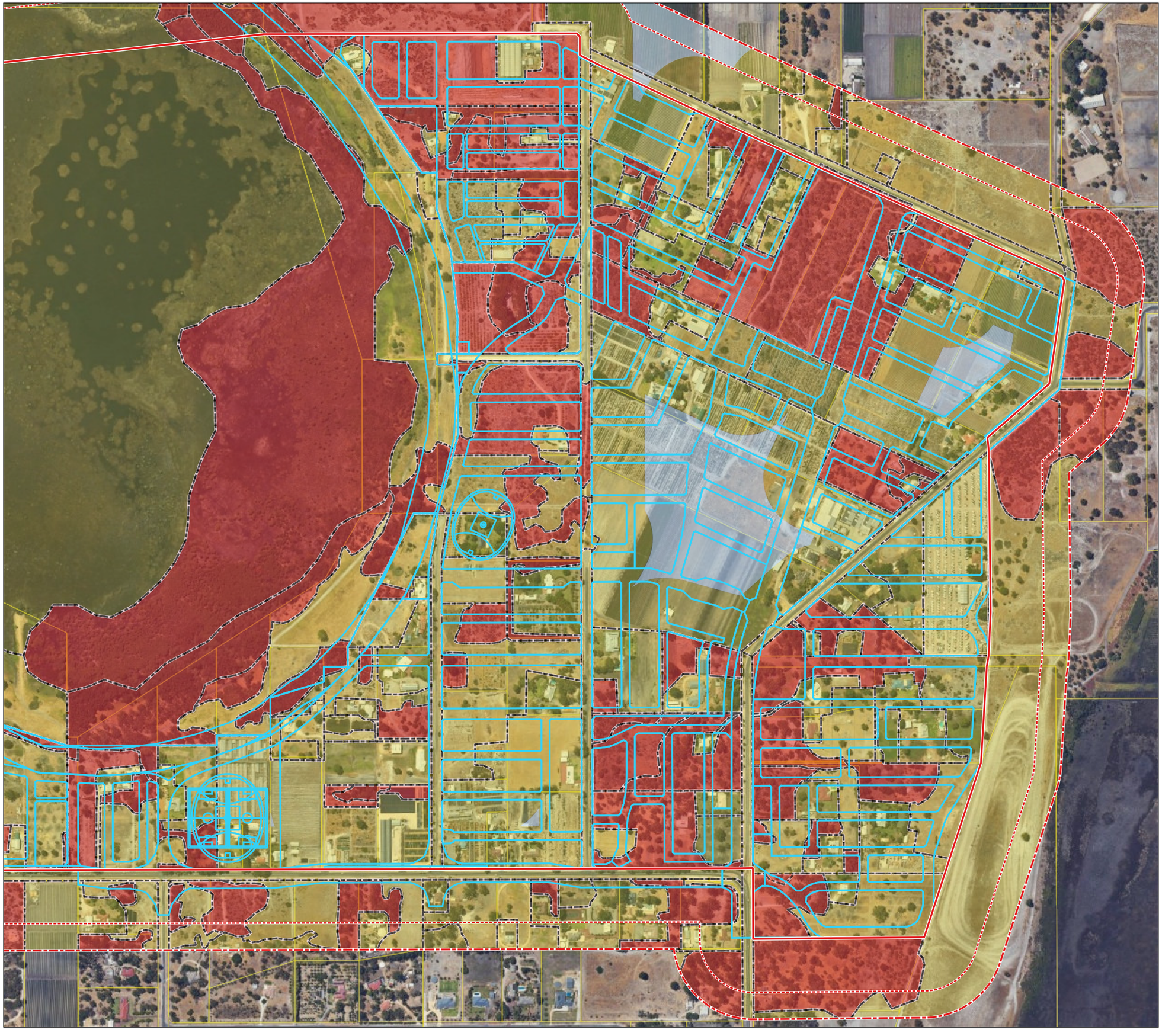
Figure 7: Pre-development BHL Assessment (West)



Legend

- Project Area
- 100m
- 150m
- Cadastre
- Vegetation Plot

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale 1:6,700

0 100 200 300 Metres

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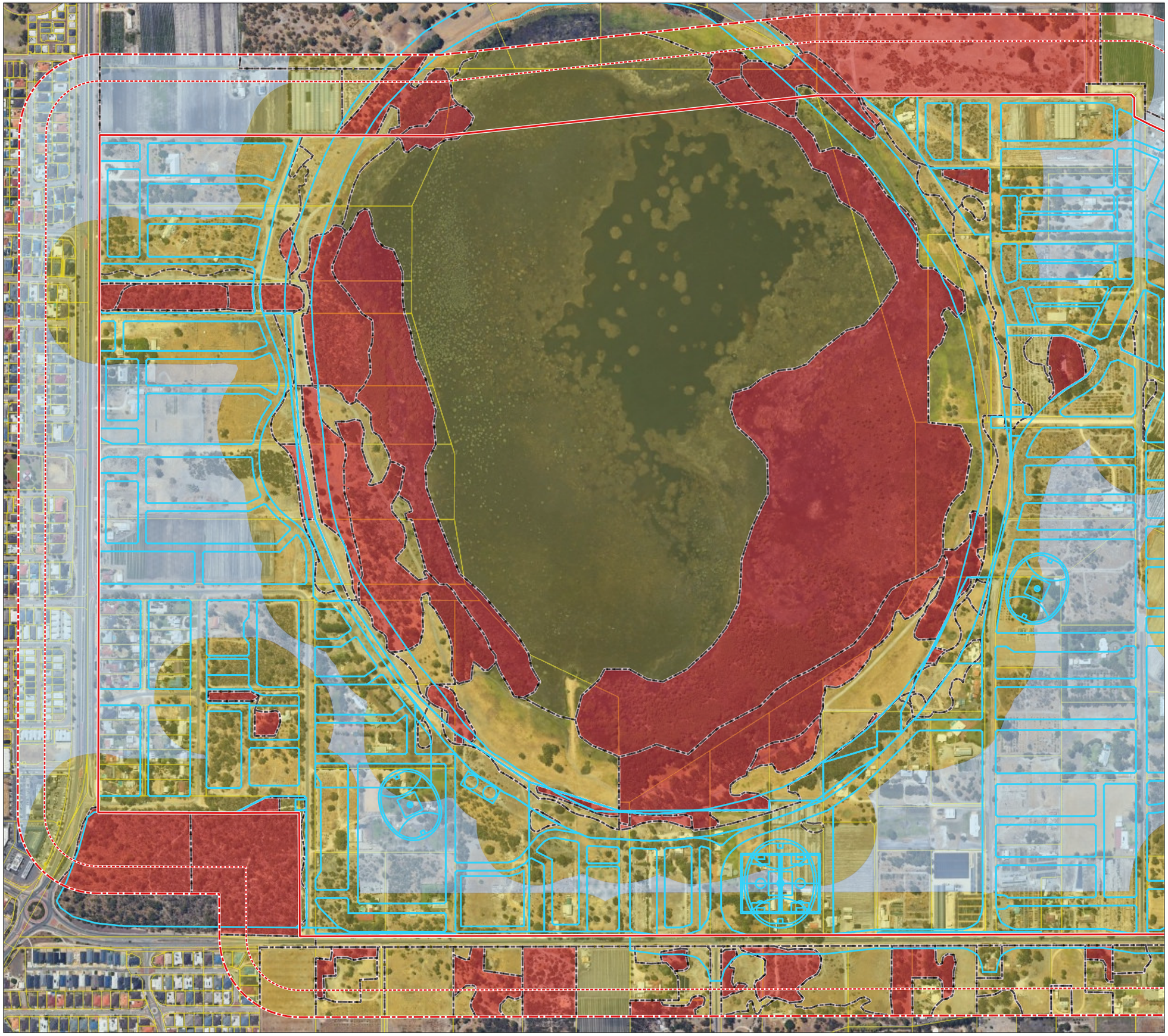
Figure 8: Pre-development BHL Assessment (East)



Legend

- Proposed Development
- Project Area

Assessment Area

- 100m
- 150m
- Vegetation Plot

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale 1:6,700

0 100 200 300 Metres

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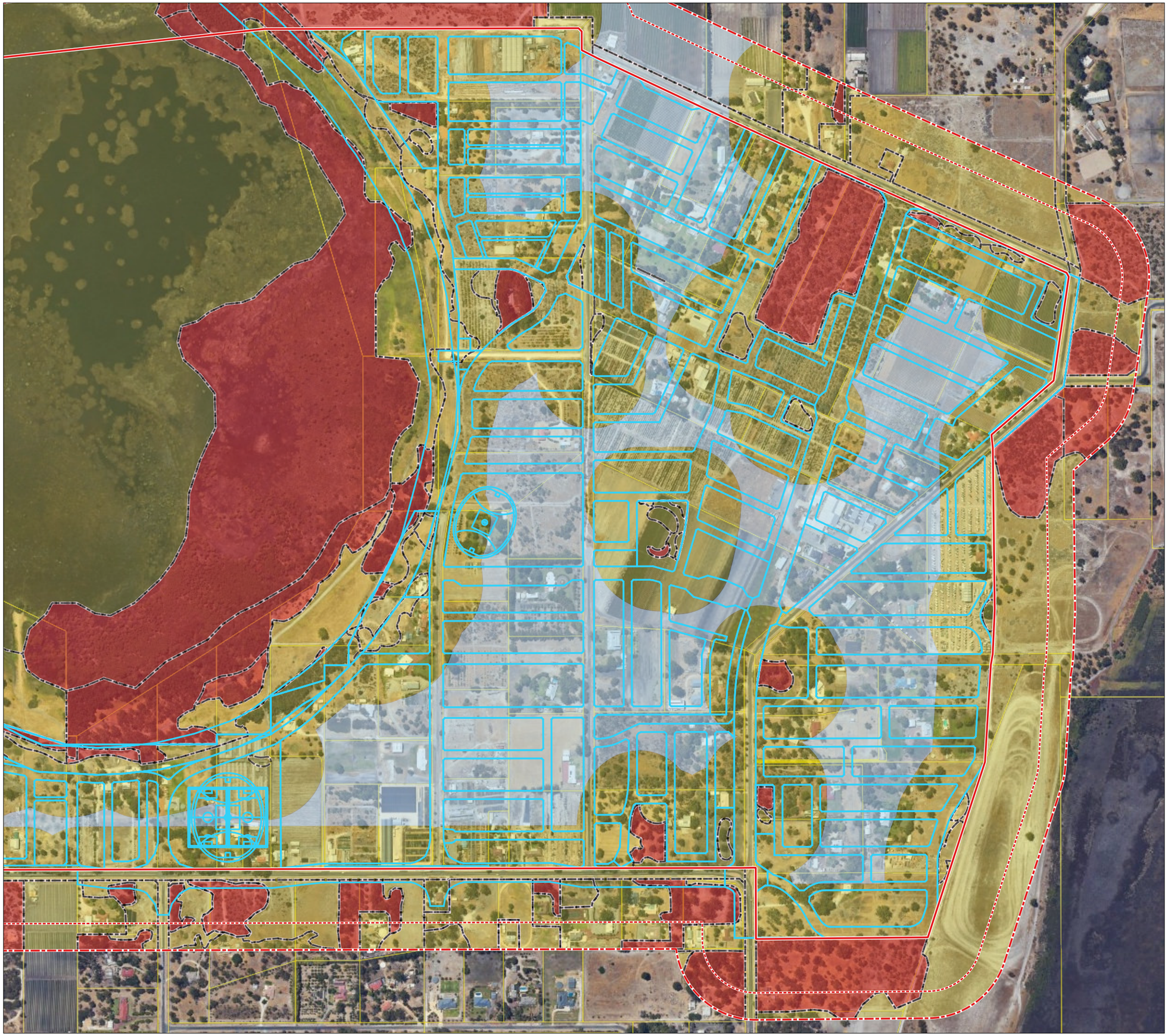
Figure 9: Post-development BHL Assessment (West)



Legend

- Proposed Development
- Project Area

Assessment Area

- 100m
- 150m
- Vegetation Plot

Bushfire Hazard Level

- Extreme
- Moderate
- Low

Scale 1:6,700

0 100 200 300 Metres

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Figure 10: Post-development BHL Assessment (East)

4.0 Identification of bushfire hazard issues

4.1 Bushfire context

Upon completion of the development, the predominant bushfire risk to the project area is from the broad extent of unmanaged vegetation to the north and east of the project area, in addition to fragmented vegetation to the south-east within rural residential plots. Fire from the north is considered to represent the greatest threat to the future development, given the extended fire runs through native vegetation. A bushfire from the east would be also have extended fire runs through pine plantation, however the plantations cease over 1 km from the project area, and Jandabup Lake also forms a significant natural barrier. Fire from the south would have a more fragmented fuel load due to existing development, and fire runs will be much shorter.

Bushfires from the north and east will have the potential to impact the site with significant levels of radiant heat and ember attack if the risk in not managed. In addition to the offsite vegetation, there is proposed onsite vegetation retention consisting of a significant plot around Mariginiup Lake and several conservation areas within the project, also represents a potential bushfire risk to this part of the development.

4.2 Bushfire hazard issues

Examination of strategic development design in accordance with the Structure Plan concept and pre and post-development bushfire hazard levels has identified the following bushfire hazard issues to be considered at future planning stages:

1. Based on the existing extent of vegetation outside proposed habitable and roads, parts of the proposed development would subject to an initial BAL of BAL-FZ, if unmanaged. In order for the development to achieve a compliant rating of BAL-29 or less, sufficient separation need to be provided between habitable development and classifiable, unmanaged vegetation. Similarly, sufficient separation will also be required from any classifiable onsite vegetation, either from retention, revegetation or rehabilitation (e.g. conservation, drainage etc), to achieve BAL-29 or less.
2. Provision of a coherent public road network to ensure occupants are able to egress away from bushfire, and fire brigade has appropriate and flexible access to habitable development and direct interfaces with unmanaged vegetation
3. Provision of a secure water supply for bushfire fighting activities.
4. Ensure the bushfire risk to any future vulnerable and high-risk land uses is appropriately considered and mitigated.

4.3 Bushfire safety strategy

The following bushfire safety strategy is proposed to demonstrate compliance with the Bushfire Protection Criteria of the Guidelines at future planning stages, in order to address the bushfire hazards identified above:

1. Create sufficient separation from classified vegetation outside and within the project area in accordance with AS 3959, and by ensuring all other land within the project area (i.e. outside areas of proposed conservation, revegetation, drainage etc), is either non-vegetated or any landscaping complies with the APZ standards of the Guidelines.

   There is likely to be retention of forest and scrub throughout the various POS areas within the proposed development, and these represent a potential source of bushfire risk. Given the POS cells are typically fragmented, should any vegetation retention be required, it may be possible to create isolated plots capable of being excludable as low threat in accordance with AS 3959 Clause 2.2.3.2 (primarily clauses 2.2.3.2 (a), (c) or

(d)). Where any retained unmanaged vegetation is not able to be excluded, adjacent development design will respond through perimeter roads or managed POS for appropriate separation (commensurate with the bushfire risk), access and water supply, working in concert with BAL-rated construction where required. The proposed response is in accordance with Guideline acceptable solutions and considered adequate to manage the inherent bushfire risk.

2. Ensure vehicular access to and from the proposed development complies with the technical specifications of Guidelines
3. Ensure a secure bushfire fighting water supply by extending the existing town main and street hydrant connections to the development, or if required, use of static tanks
4. Ensure a Bushfire Emergency Evacuation Plan accompanies the BMP for any future planning applications for vulnerable land uses.
5. Ensure a Bushfire Risk Management Plan accompanies the BMP for any future planning applications for high-risk land uses.

Based on the above, Linfire considers the bushfire hazards within and adjacent to project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. These responses will be factored into proposed development as early as possible at all stages of the planning process to ensure a suitable, compliant and effective bushfire management outcome is achieved for protection of future life, property and environmental assets.

5.0 Assessment against the bushfire protection criteria

5.1 Compliance table

An acceptable solutions assessment against the bushfire protection criteria is provided in Table 5.

Table 5: Compliance with the bushfire protection criteria of the Guidelines

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
Element 1: Location *Intent: 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*				
Performance Principle P1 The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL–29 or below, and the risk can be managed. For unavoidable development in areas where BAL–40 or BAL–FZ applies, demonstrating that the risk can be managed to the satisfaction of the decision-maker.	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL–29 or below.	**All**	**Acceptable Solution**	The post-development BHL assessment (Figures 9 and 10) demonstrate that on completion of development, all developable land, other the nominated area subject to future planning, will comprise either a Low or Moderate post-development bushfire hazard level.
Element 2: Siting and design of development ***Intent: To ensure that the siting and design of development minimises the level of bushfire impact.***				
Performance Principle P2 The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. The proposal incorporates a defendable space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.	A2.1 Asset Protection Zone (APZ) Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements: **Width**: Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL–29) in all circumstances. **Location:** the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes) **Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones' (see Guidelines Schedule 1).	**All**	**Acceptable Solution**	Where post-development vegetation (including any proposed revegetation) is not able to be excluded in accordance with AS 3959 Clause 2.2.3.2 (including retention of isolated plots as permitted under Clauses 2.2.3.2 (b), (c) and (d)), sufficient separation will be required to achieve BAL-29 at proposed habitable development. Strategies to achieve this separation include the use of: • interfacing roads, • firebreaks, • R-Code building setbacks • targeted low threat landscaping and POS • strategically located drainage basins or other Class C or G planting to reduce separation requirements. The required separation distances (including APZs where required) will be identified for each stage of planning application, where required, based confirmed lot layout and BAL contour assessment. Based on the vegetation classifications identified during the site assessment, the following separation distances may apply: • 21 m from Class A forest (flat/upslope) • 27 m from Class A forest (downslope 0°-5°) • 14 m from Class B woodland (flat/upslope) • 17 m from Class B woodland (downslope 0°-5°) • 9 m from Class C shrubland (flat/upslope) • 10 m from Class C shrubland (downslope 0°-5°) • 13 m from Class D scrub (flat/upslope) • 15 m from Class D scrub (downslope 0°-5°) • 8 m from Class G grassland (flat/upslope) • 9 m from Class G grassland (downslope 0°-5°)

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
				At future planning stages, it may also be possible to further refine the required APZs widths to more accurately respond to unmanaged vegetation. There may also be opportunities to manage the vegetation classification to limit the required separation distances. In addition to the requirement to site proposed development in BAL-29 or lower, it is noted that the National Construction Code (NCC 2022) has further bushfire protection requirements for "certain Class 9 buildings", which would apply to the proposed primary and high school developments, and includes the requirement to provide sufficient separation from classified vegetation to achieve 10 kW/m^2. It is noted that the NCC provisions apply to the suitable siting of buildings, and while each of the three school sites is large enough to provide significant areas of 10 kW/m^2 or lower, strategies to optimise this separation include: • targeted low threat landscaping and POS adjacent or near to the school site, to reduce setback requirements ○ an example of this may be the plot of forest to the north-west of the high-school site, which could be established in a parkland managed landscaping treatment, to enable exclusion as low threat vegetation, and reduce the BAL impact on this site. • use of interfacing roads as much a practical • considered school site planning to strategically site sports ovals, carparking, managed landscaping, play areas etc, in areas of 10 kW/m^2 or lower within the schools. Any identified APZs are to be implemented and maintained in accordance with Schedule 1 of the Guidelines (see Appendix 3) and the City of Wanneroo Firebreak Notice (see Appendix 6). Outside of the APZs and areas of unmanaged vegetation (conservation POS, CCW and buffer etc), any landscaping within residential areas, the three schools, the Water Corporation infrastructure and the Special Use area, will likely consist of low threat and managed gardens and street scaping in accordance with AS 3959 Clause 2.2.3.2 (f) and Schedule 1 of the Guidelines (refer to Appendix 3) as depicted on the Concept Landscaping Plan. While it is intended that separation occurs within the project area, there may also be a need to temporarily quarantine some development located on the project area boundary, where it has a direct interface (i.e. no proposed road or rail interface) with vegetation on neighbouring land. While there doesn't appear to be a need for this on the currently proposed interfaces, depending on the outcomes of future planning there may be a need for temporary quarantining to be considered. Temporary quarantining may also be required due to staging, where a temporary BAL-40/FZ impact may prevent immediate release of lots until adjacent development has commenced.
Element 3: Vehicular access ***Intent: To ensure that the vehicular access serving a subdivision/ development is available and safe***				
Performance Principle P3i The design and capacity of vehicular access and egress is to provide for the community to evacuate to a suitable destination before a bushfire arrives at the site, allowing emergency services personnel to attend the site and/or hazard vegetation.	A3.1 Public Roads *The minimum requirements under this acceptable solution are applicable to all proposed and existing public roads.* Public roads are to meet the minimum technical requirements in Table 6, Column 1. The trafficable (carriageway/pavement) width is to be in accordance with the relevant class of road in the Local Government Guidelines for Subdivisional Development (IPWEA Subdivision Guidelines), Liveable Neighbourhoods, Austroad standards and/or any applicable standards for the local government area.	**SP, Sb, Do**	**Acceptable Solution**	All public roads are to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4).
	A3.2a Multiple access routes Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access).	**SP, Sb, Do**	**Acceptable Solution**	The project area is already well-serviced by the existing public road network, especially perimeter roads and there is sufficient scope to ensure that all proposed development is provided with multiple access connections to the existing public road network, primarily Pinjar Road, Caporn Street, Rousset Road and Lakeview Street. From these existing public roads, occupants are provided with the option of travelling in all directions including north-west to Joondalup Drive, south-west to

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
	If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.			Wanneroo Road and west into existing residential development in Tapping and Ashby. Based on the Structure Plan design, the proposed indicative public road network will provide a high-level interconnection between the existing public roads, and will resolve some of the legacy dead-end roads and cul-de-sacs that currently exist within the project area. In this regard, upon completion, the proposed development is provided with at least, or more than, two access routes which meets and exceeds the requirements of Acceptable Solution A3.2a.
	A3.2b Emergency access way *Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution.* An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.	**SP, Sb, Do**	**Not Applicable** **(Acceptable Solution if required at future planning stages)**	Based on the Structure Plan design, it is not anticipated that the proposed development will require any permanent Emergency Access Ways (EAWs) to provide through access to a public road. Should the proposed development require any temporary EAWs as part of development and/or staging of vehicular access, these are to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4) and will need to be signposted, with gates kept unlocked at all times. The EAW is to be no further than 500 m from a public road at any single point.
	A3.3 Through roads All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24	**SP, Sb**	**Acceptable Solution**	Based on the Structure Plan design, there are only three no-through roads currently proposed as part of the development, which are located to the north and east of the proposed high school. The length of these no-through roads is <200 m, although it is passing through a residential built up area anyway, and there is sufficient space for a compliant 18 m wide turning head. If as part of future planning, the proposed development requires any no-through roads, or should they be required on a temporary basis as part of development staging, they will be less than 200 m in length and include either an 18 m turning head or compliant hammerhead, or be excludable under A3.2a, and are to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4).
Performance Principle P3ii The internal layout, design and construction of public and private vehicular access and egress in the subdivision / development allow emergency and other vehicles to move through it safely and easily. The design of vehicular access and egress provides: • access and egress for emergency service vehicles while allowing the community to evacuate; • a defendable space for emergency services personnel on the interface	A3.4a Perimeter Roads Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions. A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of: • separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and • removing the need for battle-axe lots that back onto areas of classified vegetation. A perimeter road is to meet the requirements contained in Table 6,	**SP, Sb**	**Acceptable Solution**	Perimeter roads around the proposed development is largely provided from Caporn Street, Pinjar Road, Lakeview Road and Rousset Road, however future public roads within the development will provide perimeter access in the following areas: • in the north-west, from Pinjar Road to the internal road along Lake Mariginiup • in the north-east from Lakeview Road to the internal road along Lake Mariginiup • in the south-west from an extension of Edward Street to Wells Street, providing an interface road with Caporn Park. • In the south-east from Roussett Road and Franklin Road, to the internal road, providing interfaces to adjacent lots. The Structure Plan ensures that perimeter roads are provided as required under A 3.4a, to ensure appropriated separation from classified vegetation.

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
between classified vegetation and development site; and • hazard separation between classified vegetation and the subject site to reduce the potential radiant heat that may impact a lot(s).	Column 1. A perimeter road may not be required where: • the adjoining classified vegetation is Class G Grassland; • lots are zoned for rural living or equivalent; • it is demonstrated that it cannot be provided due to site constraints; or • all lots have frontage to an existing public road			
Performance Principle P3iii Vehicular access is provided which allows: • access and egress for emergency service vehicles; • defendable space for emergency services personnel on the interface • between classified vegetation and development; and • hazard separation between classified vegetation and the site to reduce the potential radiant heat that may impact a lot(s).	A3.4b Fire service access route *Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation.* A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.	**SP, Sb**	**Not Applicable** **(Acceptable Solution if required in future planning applications)**	Based on the Structure Plan design, the proposed development would not require fire service access routes (FSARs) to achieve access within and around the perimeter of the project area. Should an FSAR be required as part of future planning stages, they will be constructed to the relevant technical requirements of the Guidelines (see Appendix 4) including interconnecting with the public road network at 500 m intervals, be through roads no further than 500 m from a public road, and have turnarounds every 500 m.
Performance Principle P3iv Vehicular access is provided which allows emergency service vehicles to directly access all habitable buildings and water supplies and exit the lot without entrapment	A3.5 Battle-axe access legs *Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution.* There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area. In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements: • requirements in Table 6, Column 4; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres)	**Sb**	**Not applicable** **(Acceptable Solution if applicable in future planning applications)**	No battle-axes are depicted on the Structure Plan as part of the proposed development, although there is insufficient internal lot detail to fully confirm at this stage. While battle-axe lots should be avoided in bushfire prone areas, where unavoidable as part of future planning applications, where further than 50 m from public roads, they will be constructed to the relevant technical requirements of the Guidelines (see Appendix 4), including passing bays at 200 m intervals.
	A3.6 Private driveways There are no private driveway technical requirements where the private driveway is: • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not	**Dd, Do**	**Acceptable Solution**	It is anticipated that most of the proposed lots are of size where all future habitable development will likely be located within 70 m of a public road (with speed limit <70 km/hr) with reticulated water supply. The exceptions would likely be the proposed schools, Water Corporation site, Special Use area. Should lots not comply with the exclusions for private driveways as part of future planning applications, they are to be constructed to the relevant technical requirements of the Guidelines (see Appendix 4), including turn-around areas within 30 m of each building, passing bays if driveways are longer than 200 m.

Bushfire protection criteria			Development response	
Performance Principle	**Acceptable solutions**	**Planning Stage**	**Method of compliance**	**Proposed bushfire management measures**
	greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements: • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.			
Element 4: Water ***Intent: To ensure that water is available to enable people, property and infrastructure to be defended from bushfire***				
No Performance Principle Applies	A4.1 Identification of future water supply Evidence that a reticulated or sufficient non-reticulated water supply for bushfire fighting can be provided at the subdivision and/or development application stage, in accordance with the specifications of the relevant water supply authority or the requirements of Schedule 2. Where the provision of a strategic water tank(s) is required a suitable area within a road reserve or a dedicated lot the location should be identified, should be identified on the structure plan, to the satisfaction of the local government.	**SP**	**Acceptable Solution**	Given the proposal is for residential development, the project area is to be provided with a reticulated water supply, extended from existing Water Corporation town main supply in existing development located to the west and south-west of the project area. While it is expected that the proposed development will be provided with a reticulated water supply, if this is not possible for any reason, then strategic bushfire water tanks would be required to achieve compliance with A4.1. Firefighting water supply to larger developments within the project area (e.g. schools, special use area), may be provided by onsite fire hydrant systems that may be installed at these facilities, if triggered by the National Construction Code).

Performance Principle P4
The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.
Provide a permanent water supply that is:
• sufficient and available for firefighting purposes;
• constructed from non-combustible materials (e.g. steel), or able to
• maintain its integrity throughout a bushfire; and
accessible, with legal access for maintenance and re-filling by tankers and emergency service vehicles
	A4.2 Provision of water for firefighting purposes
	Where a reticulated water supply is existing or proposed, hydrant connection(s) should be provided in accordance with the specifications of the relevant water supply authority. Where these specifications cannot be met, then the following applies:
	• The provision of a water tank(s), in accordance with the requirements of Schedule 2; and
	• Where the provision of a strategic water tank(s) is applicable, then the following requirements apply:
	  ○ land to be ceded free of cost to the local government for the placement of the tank(s);
	  ○ the lot or road reserve where the tank is to be located is identified on the plan of subdivision;
	  ○ tank capacity, construction, and fittings, provided in accordance with the requirements of Schedule 2; and
	  ○ a strategic water tank is to be located no more than 10 minutes from the subject site (at legal road speeds).
	Where a subdivision includes an existing habitable building(s) that is to be retained, a water supply should be provided to this existing habitable building(s), in accordance with the requirements listed above.
		Sb, Dd, Do	**Acceptable Solution**	The Water Corporation town main supply design, including street hydrants, is expected to be in accordance with Water Corporations Design Standard 63 requirements.
				In the unlikely event a compliant reticulated water supply is not achievable to any part of the proposed development, any required strategic bushfire water tanks would need to be sized in accordance with Schedule 2 (refer to Appendix 5), and designed in accordance with the requirements of the local council and the technical requirements of Schedule 2 of the Guidelines.

*** *Applicable Planning Stages*** **(SP** - Strategic planning and structure plan where lot layout is unknown; **Sb** - Structure plan where lot layout is known and subdivision application; **Dd** – Development application for a single dwelling, ancillary dwelling or minor development; **Do** – Development application for any other development)

6.0 Responsibilities for implementation and management of the bushfire measures

This BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. Aside from the preparation of future BMPs to accompany future subdivision and development applications where appropriate, there are no further items to implement, enforce or review at this strategic stage of the planning process.

Future BMPs prepared for subsequent subdivision and development applications are to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measures 6.4 and 6.5 respectively) and demonstrate in detail how the proposed future development will incorporate the relevant acceptable solutions or meet the performance requirements of the Guidelines. Future BMPs are to include the following detailed information:

- proposed lot layout, including any residential and commercial lots, primary and high school lots, high risk land uses, roads, POS/drainage areas, etc
- detailed landscape plans for all POS, drainage and areas of revegetation or retention (including within the wetland and buffer), to confirm the final extent of classified vegetation (retained or revegetated) and exclusions (non-vegetated areas and low threat vegetation)
- final determination of post development classified vegetation extent, exclusions and effective slope
- BAL contour map demonstrating that proposed development areas will achieve BAL–29 or lower (may require designation of building envelopes)
- width and alignment of compliant APZs/setbacks
- confirmation of how bushfire management will be addressed during development staging including consideration of low threat staging buffers and vehicular access (temporary cul-de-sacs/EAWs)
- proposed approach to fuel management throughout POS, vacant land, staging buffers, adjacent properties and road verges; or application of AS 3959 in response to classified vegetation
- vehicular access provisions, including demonstration that a minimum of two access routes will be achieved for each stage of development in accordance with Acceptable Solution A3.1
- water supply provisions with regards to reticulated water supply provisions (including network of street hydrants), or static tanks if required
- demonstration of compliance with the bushfire protection criteria of the Guidelines
- requirements for any proposed vulnerable land uses (e.g. primary and high schools), including provision of a BMP and BEEP to accompany the development application
- requirements for any proposed high-risk land uses (e.g. service stations), including provision of a BMP and Bushfire Risk Management Plan to accompany the development application
- consideration of the requirements of the NCC as it applies to the school sites, and any other relevant Class 9 buildings (if known), especially site planning considerations with respect to separation from classified vegetation.
- requirements for BMP compliance reports as a condition of subdivision
- provisions for notification on Title for any future lots with a rating of BAL–12.5 or greater

as a condition of subdivision

- compliance requirements with the current local government annual firebreak notice, as amended or varied
- construction of Class 1, 2, 3 or associated 10a buildings in accordance with AS 3959 to the assessed BAL rating
- proposed implementation and audit program outlining all measures requiring implementation and the appropriate timing and responsibilities for implementation.

On the basis of the information contained in this BMP, Linfire considers the bushfire hazards within and adjacent to the project area and the associated bushfire risks are manageable through standard management responses outlined in the Guidelines and AS 3959. Linfire note that the land between the two potential traffic corridor alignments is still under review and subject to future planning. Once the transport corridor is determined and further planning is progressed, the proposed layout design will need to be reviewed against the bushfire provisions and compliance demonstrated with the bushfire Guidelines. Notwithstanding, Linfire considers that upon implementation of the proposed management measures, the project area will be able to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959.

7.0 References

Department of Fire and Emergency Services (DFES) 2023, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: https://maps.slip.wa.gov.au/landgate/bushfireprone/,

Department of Planning (DoP) 2016, *Visual guide for bushfire risk assessment in Western Australia*, Department of Planning, Perth.

Standards Australia (SA) 2018, Australian Standard *AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.

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

Western Australian Planning Commission (WAPC) 2021, *Guidelines for Planning in Bushfire Prone Areas*, Version 1.4 December 2021, Western Australian Planning Commission, Perth.

Appendix 1 Concept Landscape Plan

REFER TO LOCAL STRUCTURE PLAN REPORT
APPENDIX 6:
LANDSCAPE MASTERPLAN

Appendix 2 Vegetation plot photos and description

Photo ID: 1a

Plot number		Plot 1
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 2a

Photo ID: 2b

Photo ID: 2c

Photo ID: 2d

Photo ID: 2e

Photo ID: 2f

Plot number		Plot 2
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 2g

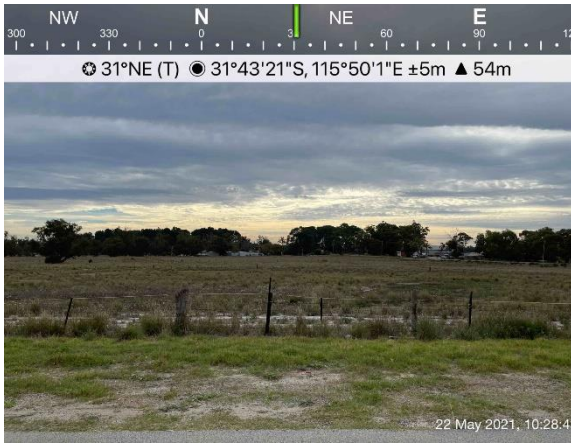

Photo ID: 2h

Photo ID: 2i

Photo ID: 2j

Photo ID: 2k

Photo ID: 2l

Plot number		Plot 2
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 2m

Photo ID: 2n

Plot number		Plot 2
Vegetation classification	Pre-development	Class G Grassland
	Post-development	Class G Grassland
Description / justification		Grassland greater than 100 mm in height

Photo ID: 3a

Plot number		Plot 3
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

Photo ID: 4a

Photo ID: 4b

Photo ID: 4c

Photo ID: 4d

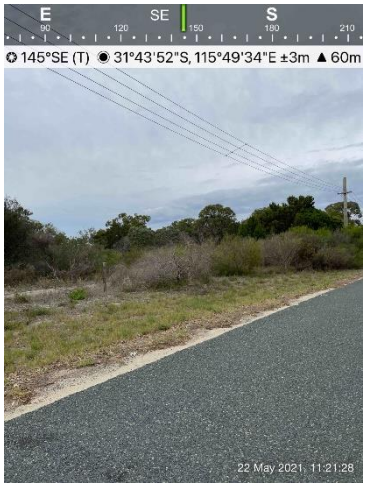

Photo ID: 4e

Photo ID: 4f

Plot number		Plot 4
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

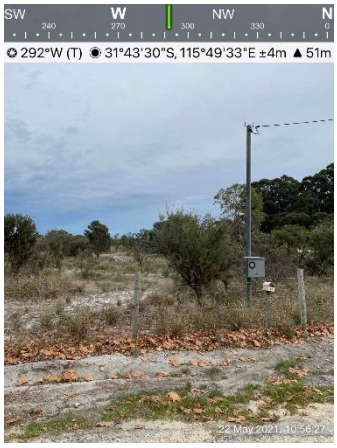

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Photo ID: 4h

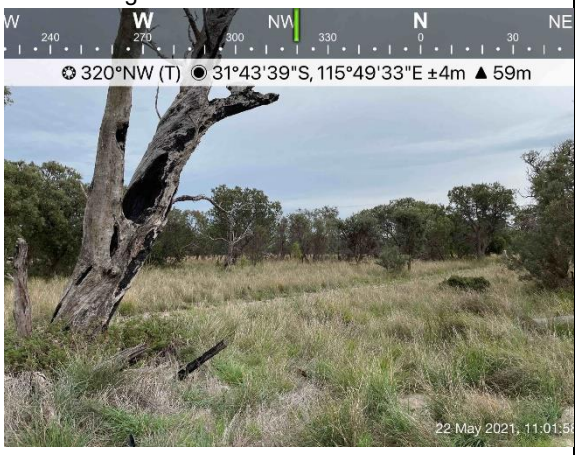


Photo ID: 4i

Photo ID: 4j

Photo ID: 4k

Photo ID: 4l

Plot number		Plot 4
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

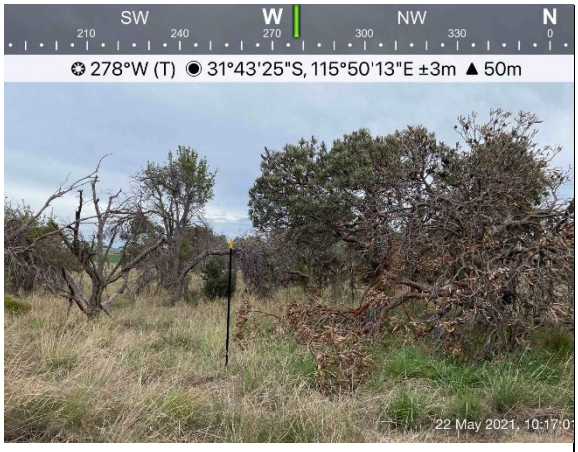


Photo ID: 4m

Photo ID: 4n

Photo ID: 4o

Photo ID: 4p

Photo ID: 4q

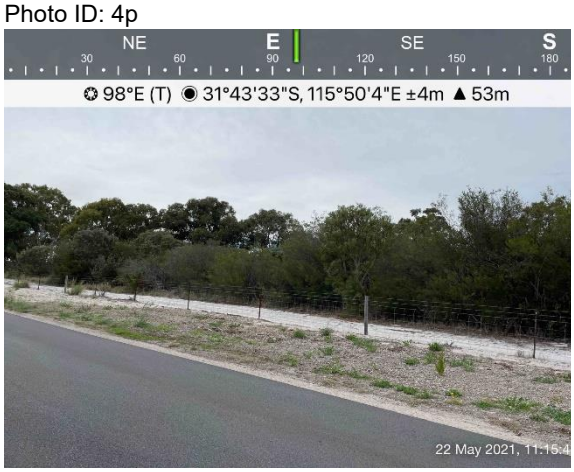


Photo ID: 4r

Plot number		Plot 4
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

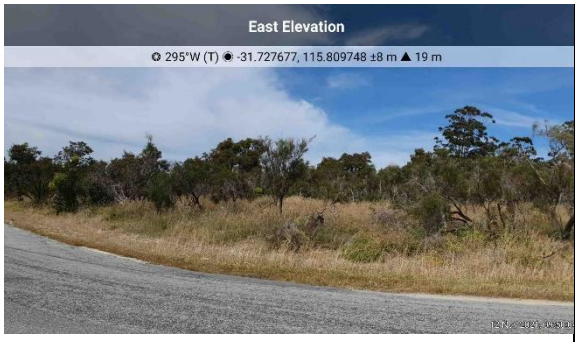


Photo ID: 4s

Photo ID: 4t

Photo ID: 4u

Photo ID: 4v

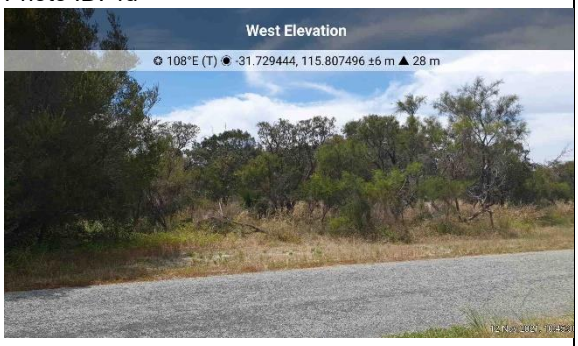


Photo ID: 4w

Photo ID: 4x

Plot number		Plot 4
Vegetation classification	Pre-development	Class D Scrub
	Post-development	Class D Scrub
Description / justification		Vegetation with a continuous horizontal and vertical structure, greater than 2 m high at maturity

Photo ID: 6a

Photo ID: 6b

Plot number		Plot 6
Vegetation classification	Pre-development	Class C Shrubland
	Post-development	Class C Shrubland
Description / justification		Shrub vegetation less than 2 m high at maturity

Photo ID: 8a

Photo ID: 8b

Photo ID: 8c

Photo ID: 8d

Photo ID: 8e

Photo ID: 8f

Plot number		Plot 8
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

Photo ID: 8g

Photo ID: 8h

Photo ID: 8i

Photo ID: 8j

Photo ID: 8k

Photo ID: 8l

Plot number		Plot 8
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

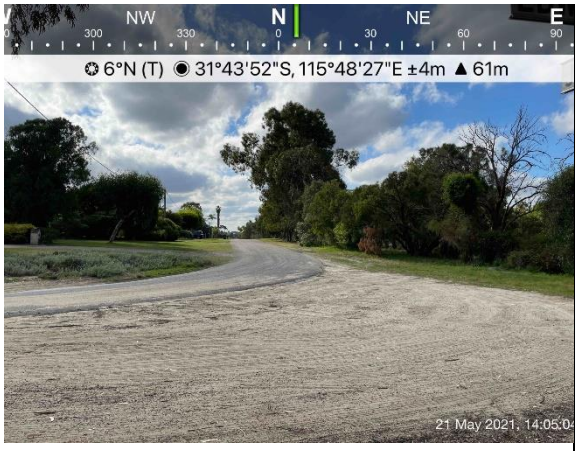


Photo ID: 8g

Photo ID: 8h

Photo ID: 8i

Photo ID: 8j

Photo ID: 8k

Photo ID: 8l

Plot number		Plot 8
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

Photo ID: 8m

Photo ID: 8n

Photo ID: 8o

Photo ID: 8p

Photo ID: 8q

Photo ID: 8r

Plot number		Plot 8
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

Photo ID: 8s

Photo ID: 8t

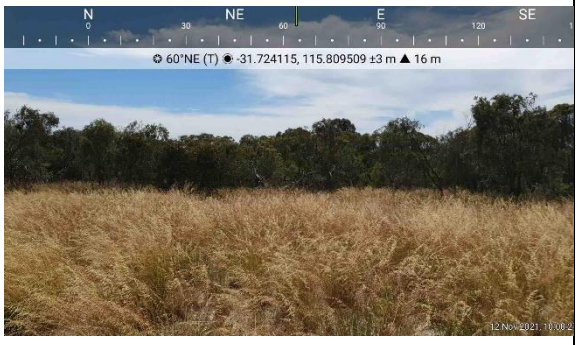


Photo ID: 8u

Photo ID: 8v

Photo ID: 8w

Photo ID: 8x

Plot number		Plot 8
Vegetation classification	Pre-development	Class A Forest
	Post-development	Class A Forest
Description / justification		Trees 10-30 m high at maturity, dominated by Eucalypts, multi-tiered structure comprising tall canopy layer, shrubby middle layer and grass/herb/sedge understorey

Photo ID: 9a

Plot number		Plot 9
Vegetation classification	Pre-development	Class B Woodland
	Post-development	Class B Woodland
Description / justification		Trees 2-30 m at maturity, dominated by trees with a grassy understorey (lacks shrubby middle layer and deep surface litter)

Photo ID: 10a

Photo ID: 10b

Photo ID: 10c

Photo ID: 10d

Photo ID: 10e

Photo ID: 10f

Plot number		Plot 10
Vegetation classification	Pre-development	Class B Woodland
	Post-development	Class B Woodland
Description / justification		Trees 2-30 m at maturity, dominated by trees with a grassy understorey (lacks shrubby middle layer and deep surface litter)

Photo ID: 10g

Photo ID: 10h

Photo ID: 10i

Plot number		Plot 10
Vegetation classification	Pre-development	Class B Woodland
	Post-development	Class B Woodland
Description / justification		Trees 2-30 m at maturity, dominated by trees with a grassy understorey (lacks shrubby middle layer and deep surface litter)

Photo ID: 11a

Photo ID: 11b

Photo ID: 11c

Photo ID: 11d

Photo ID: 11e

Photo ID: 11f

Plot number		Plot 11
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

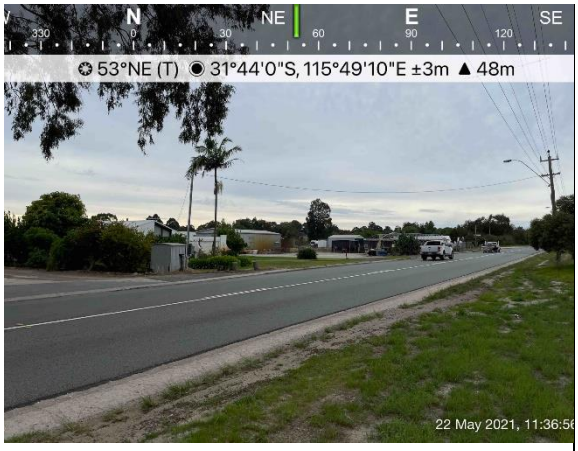


Photo ID: 11g

Photo ID: 11h

Photo ID: 11i

Photo ID: 11j

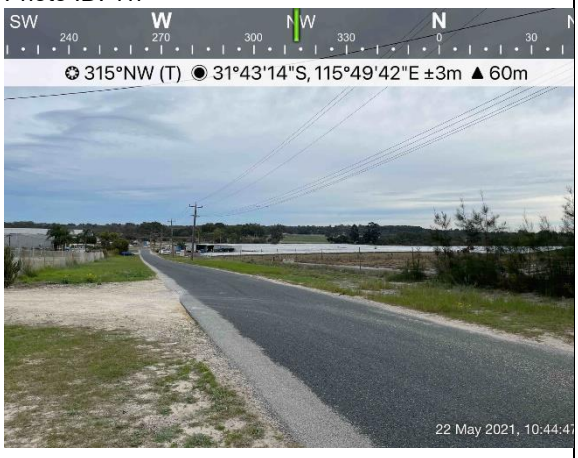


Photo ID: 11k

Photo ID: 11l

Plot number		Plot 11
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

Photo ID: 11m

Photo ID: 11n

Photo ID: 11o

Photo ID: 11p

Plot number		Plot 11
Vegetation classification	Pre-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
	Post-development	Excluded – Non-vegetated and Low threat (Clause 2.2.3.2 [e] and [f])
Description / justification		Low threat cultivated gardens and maintained lawns within surrounding properties and non-vegetated areas including roads, footpaths, driveways and building footprints

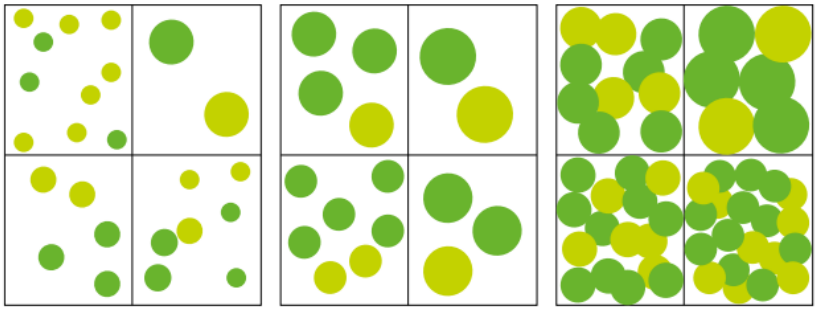
Appendix 3 APZ standards (Schedule 1 of the Guidelines)

An APZ is a low fuel area maintained around a habitable building to increase the likelihood that it will survive a bushfire, by providing a defendable space and reducing the potential for direct flame contact, radiant heat exposure and ember attack.

Vegetation management within an APZ should provide defendable space and be maintained to a low threat state, in perpetuity, in accordance with the requirements outlined in Schedule 1.

Schedule 1: Standards for Asset Protection Zones

- **Trees* (> 6 metres in height)**
  - Trunks at maturity should be a minimum distance of six metres from all elevations of the building.
  - Branches at maturity should not touch or overhang a building or powerline.
  - Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation.
  - Canopy cover within the APZ should be <15 per cent of the total APZ area.
  - Tree canopies at maturity should be at least five metres apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided that the total canopy cover within the APZ will not exceed 15 per cent and are not connected to the tree canopy outside the APZ.



- **Shrub* and Scrub* (0.5 metres to 6 metres in height)**
  - Should not be located under trees or within three metres of buildings.
  - Should not be planted in clumps >5 square metres in area.
  - Clumps should be separated from each other and any exposed window or door by at least 10 metres.
  - Shrub and scrub >6 metres in height are to be treated as trees.
- **Ground covers (<0.5 metres in height)**
  - Can be planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above.
  - Can be located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height.
  - Ground covers >0.5 metres in height are to be treated as shrubs
- **Grass**
  - Grass should be maintained at a height of 100 millimetres or less, at all times.
  - Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.
- **Fine Fuel load (combustible dead vegetation mater <6 mm in thickness)****
  - Should be managed and removed on a regular basis to maintain a low threat state.
  - Should be maintained at <2 tonnes per hectare (on average).
  - Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch

Schedule 1: Standards for Asset Protection Zones

>6 millimetres in thickness.

- **Defendable Space**
  - Within three metres of each wall or supporting post of a habitable building, the area is kept free from vegetation, but can include ground covers, grass and non-combustible mulches as prescribed above.
- **Fences within the APZ**
  - Should be constructed from non-combustible materials (for example, iron, brick, limestone, metal post and wire, or bushfire-resisting timber referenced in Appendix F of AS 3959)
- **LPG Cylinders**
  - Should be located on the side of a building furthest from the likely direction of a bushfire or on the side of a building where surrounding classified vegetation is upslope, at least one metre from vulnerable parts of a building.
  - The pressure relief valve should point away from the house.
  - No flammable material within six metres from the front of the valve.
  - Must sit on a firm, level and non-combustible base and be secured to a solid structure.

** Plant flammability, landscaping design and maintenance should be considered – refer to explanatory notes*

*** Fine fuel load should be maintained to less than two tonnes per hectare, however this is often a subjective assessment.*

- *Reducing fuel load levels does not necessarily require the removal of existing vegetation. A combination of methods can be utilised to reduce fuel load such as raking, weed removal, pruning, mulching and/or the removal of plant material.*
- *A simple method to estimate fuel load is to roughly equate one tonne of fuel load per hectare as 100 grams per square metre. For example, two tonnes per hectare of leaf litter is roughly 200 grams of leaf litter per square metre and eight tonnes per hectare is roughly 800 grams.*
- *Eucalyptus leaf litter is approximately 100 grams per handful, so two handfuls of litter per square metre will roughly equate to two tonnes per hectare.*
- *Different types of fine fuel, like mulch or pine needles may be more or less than a handful, however the 100 grams per square metre rule of thumb can still be used.*

E2 Plant flammability

There are certain plant characteristics that are known to influence flammability, such as moisture or oil content and the presence and type of bark. Plants with lower flammability properties may still burn during a bushfire event, but may be more resistant to burning and some may regenerate faster post-bushfire.

There are many terms for plant flammability that should not be confused, including:

- Fire resistant – plant species that survive being burnt and will regrow after a bushfire and therefore may be highly flammable and inappropriate for a garden in areas of high bushfire risk.
- Fire retardant – plants that may not burn readily or may slow the passage of a bushfire.
- Fire wise – plants that have been identified and selected based on their flammability properties and linked to maintenance advice and planting location within a garden.

Although not a requirement of these Guidelines, local governments may develop their own list of fire wise or fire retardant plant species that suit the environmental characteristics of an area. When developing a recommended plant species list, local governments should consult with ecologists,

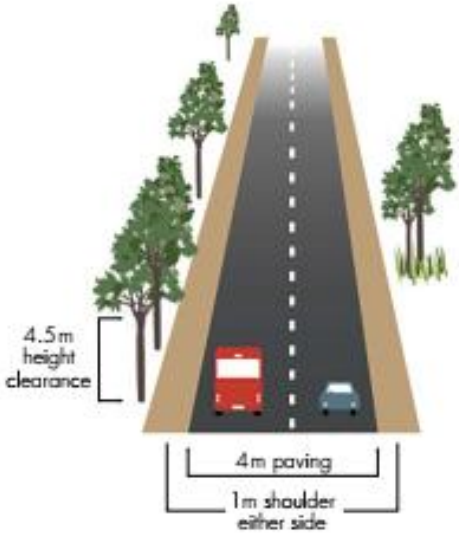
land care officers or environmental authorities to ensure the plants do not present a risk to endangered ecological communities, threatened, or endangered species or their habitat.

When selecting plants, private landholders and developers should aim for plants within the APZ that have the following characteristics:

- grow in a predicted structure, shape and height;
- are open and loose branching with leaves that are thinly spread;
- have a coarse texture and low surface-area-to-volume ratio;
- will not drop large amounts of leaves or limbs, that require regular maintenance;
- have wide, flat, and thick or succulent leaves;
- trees that have bark attached tightly to their trunk or have smooth bark;
- have low amounts of oils, waxes, and resins (which will often have a strong scent when crushed);
- do not produce or hold large amounts of fine dead material in their crowns; and/or
- will not become a weed in the area.

Refer to the WAPC Bushfire and Vegetation Fact Sheet for further information on clearing and vegetation management and APZ landscaping, design and plant selection reference material.

Appendix 4 Vehicular access technical standards of the Guidelines

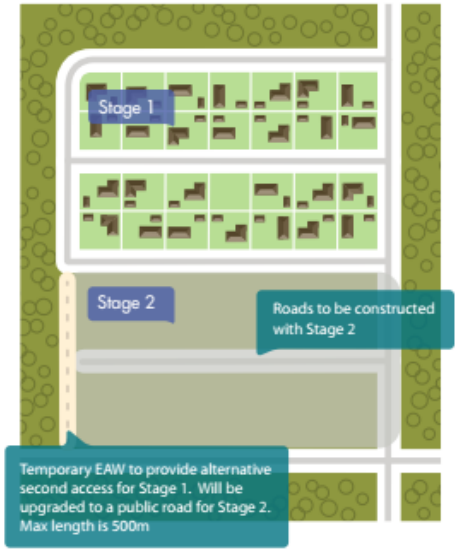
Public roads
Acceptable Solution A3.1
Public roads are to meet the minimum technical requirements in Table 6, Column 1.
Explanatory note E3.1
These Guidelines do not prescribe values for the trafficable (carriageway/pavement) width of public roads as they should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area. The IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards do not prescribe a horizontal clearance. However, it is recommended that a traversable verge is provided to allow for emergency services vehicles to stop and operate on the side of the public road, specifically where the public road may traverse large areas of classified vegetation. Where local government roads are proposed to be widened by the proponent, they must obtain approval from the local government    Figure 20: Example of a public road

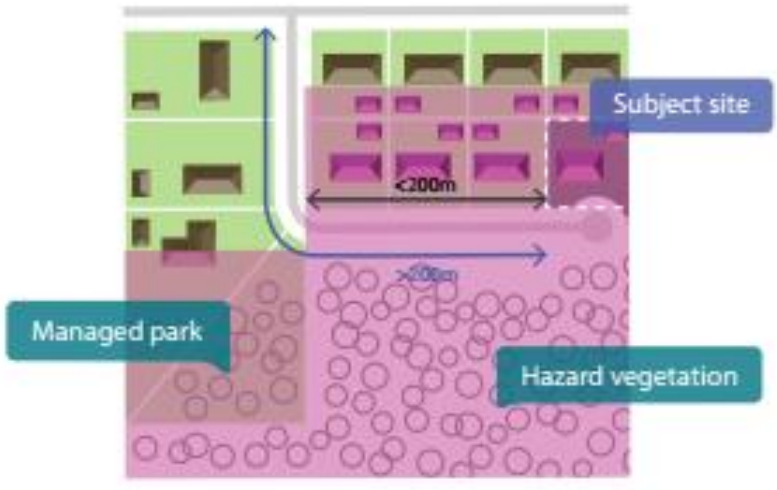
Multiple Access Routes
Acceptable solution A3.2a
Public road access is to be provided in two different directions to at least two different suitable destinations with an all-weather surface (two-way access). If the public road access to the subject site is via a no-through road which cannot be avoided due to demonstrated site constraints, the road access is to be a maximum of 200 metres from the subject lot(s) boundary to an intersection where two-way access is provided. The no-through road may exceed 200 metres if it is demonstrated that an alternative access, including an emergency access way, cannot be provided due to site constraints and the following requirements are met: • the no-through road travels towards a suitable destination; and • the balance of the no-through road, that is greater than 200 metres from the subject site, is wholly within BAL-LOW, or is within a residential built-out area – Figure 23.
Explanatory note E3.2a
Two-way public road access is public road access from a lot in at least two different directions to two suitable destinations, and provides residents and the community, as well as emergency services, with access and egress from both the subdivision and individual habitable buildings/development in the event of a bushfire emergency. A single road provides no alternative route if the access becomes congested or is unable to be traversed due to smoke and/or fallen trees during a bushfire. Two-way public road access applies to access/egress routes leading into a subdivision, as well as those within a subdivision. A road that loops back onto itself does not constitute the option of two different directions. Two-way public road access should always be the first option. Where the site is not able to achieve two-way access within 200 metres of the lot boundary, due to demonstrated site or environmental constraints, the proponent should identify options for an emergency access way from the subject site to a suitable destination. Where an emergency access way cannot be provided, the proponent should demonstrate compliance with the performance principle. Subject sites or proposed lots greater than 200 metres from an intersection, which provides two-way access, do not satisfy the requirement for two-way access unless they meet the provisions which allow for nothrough roads greater than 200 metres in A3.2a. To demonstrate compliance with the performance principle for two-way access, the bushfire planning practitioner may have regard to: (a) the extent of the bushfire hazard, location and vegetation classification, the likelihood, potential severity and impact of bushfire to the subject site and the road network; (b) time between fire detection and the onset of conditions in comparison to travel time for the community to evacuate to a suitable destination; (c) available access route(s) travelling towards a suitable destination; and (d) turn-around area for a fire appliance for no-through roads

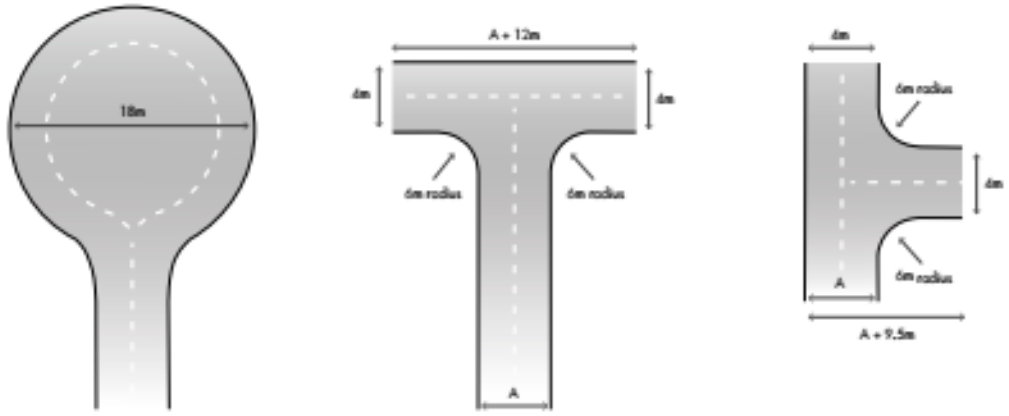
Multiple Access Routes

Figure 21: Example of compliant and non-compliant two-way

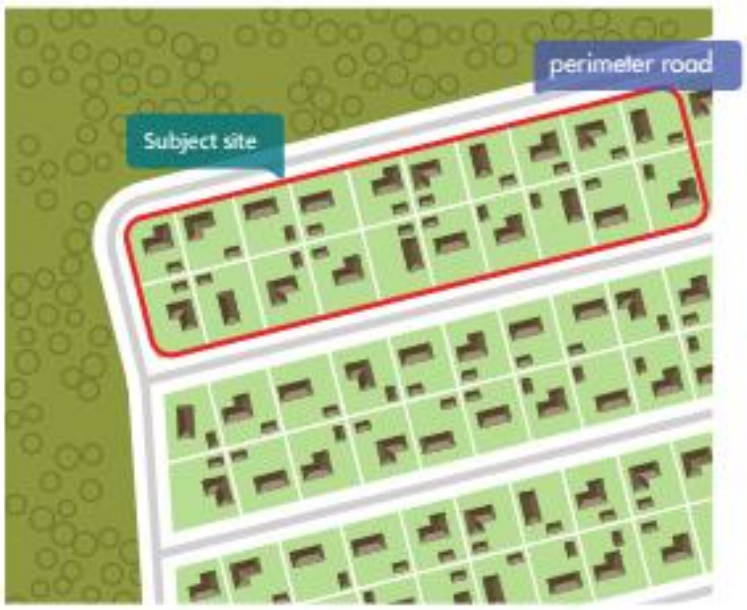
Emergency access way
Acceptable solution A3.2b
Where it is demonstrated that A3.2a cannot be achieved due to site constraints, or where an alternative design option does not exist, an emergency access way can be considered as an acceptable solution. An emergency access way is to meet all the following requirements: • requirements in Table 6, Column 2; • provides a through connection to a public road; • be no more than 500 metres in length; and • must be signposted and if gated, gates must open the whole trafficable width and remain unlocked.
Explanatory note E3.2b
An emergency access way is not a preferred alternative to through public road access and should only be considered acceptable where it has been demonstrated that it will provide the safety and performance needs of emergency services and the community, including consideration for future needs, and that public road access to satisfy A3.2a cannot be achieved due to site constraints, such as an established road network with no opportunity to provide a public road for secondary access. Acceptance of an emergency access way should also consider the ability to accommodate reasonable worst-case vehicle volumes. The principle function of the emergency access way is to provide a contingency (second) community evacuation route and simultaneously provide access for emergency services, in the event of a bushfire emergency. Where an emergency access way traverses classified vegetation, which has the potential to create a bushfire hazard, an emergency access way performs the secondary function of providing access by emergency services to this vegetation. Emergency access ways should connect to a public road to allow alternative two-way through access. An emergency access way should not exceed 500 metres in length as they may not be as safe for road-use due to not being designed or constructed to the full requirements of a public road and may present uncertainties to emergency service personnel and the public as they are not part of the daily road network and not identified on Maps. <u>Permanent public emergency access way</u> An emergency access way can be provided as either a public easement in gross or a right-of-way. In both approaches, the management of the emergency access way is by the local government as the grantee of the easement or management body of the right-of-way. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or right-of-way; this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/ or the local government and is also dependent on whether the land is to remain in private ownership or be ceded to the Crown. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take. If the emergency access way is provided as an easement, it should be provided as a public easement in gross under sections 195 and 196 of the Land Administration Act 1997 in favour of the local government and/or public authority, to ensure accessibility for emergency services and the public at all times. To be provided as a right-of-way the emergency access way should be vested in the Crown under section 152 of the Planning and Development Act 2005 as a right-of way and such land to be ceded free of cost and without any payment or compensation by the Crown. If gates are used to control traffic flow during non-emergency periods, these will be managed by the local government and must not be locked. Gates should be double gates wide enough to access the full pavement width and accommodate Type 3.4 fire appliances with the design and construction to be approved by the relevant local government. <u>Temporary public emergency access way</u> A temporary emergency access way may be proposed to facilitate the staging arrangements of a subdivision. The provision of two public roads may not be possible in the first stage of the subdivision and an emergency access way can be provided as an interim access route until the second public road is developed and gazetted in a subsequent stage of the subdivision (see figure 22). The emergency access way should be provided in the same manner as a permanent emergency access way, but it should be removed from the certificate of title once the public road is developed and gazetted. Where an emergency access way is

Emergency access way
proposed as an alternative to a public road, the Bushfire Management Plan should provide thorough justification for its use. Restricted public emergency access way There may be some instances where a restricted emergency access way is proposed as a performance principle based solution where access is only available to the public in the event of a bushfire emergency. This option can only be considered where the local government or Main Roads WA have advised that vehicular access on the emergency access way is not allowed during non-emergency periods, as it provides an additional thoroughfare and entry point on a local or State road. In this scenario, the emergency access way can be provided as an easement under section 195 of the Land Administration Act 1997, as public access in the event of a bushfire emergency or vested in the Crown as a reserve under section 152 of the Planning and Development Act 2005. Such land is to be ceded free of cost without any payment or compensation by the Crown. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the proposed reserve and agree to the terms of the Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval. The purpose of the reserve should be for a public purpose specified in the condition related to the subdivision, for example for emergency access only, or for emergency access and recreation. A reserve for emergency access and recreation can optimise the land-use as a dual purpose where it provides vehicular access in the event of a bushfire emergency, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage can ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government. Right-of-carriageway emergency access way There may be some instances where a right-of-carriageway easement is proposed as a performance principle-based solution. This may be where particular landowner(s) and emergency services, but not the public, require access over a neighbouring lot(s). A right-of-carriageway easement should be provided under section 195 of the Land Administration Act 1997. The easement is to provide alternative access for the particular landowner(s) in the event of a bushfire emergency and not for use by the public. In this scenario, support will be necessary from the adjoining lot owner(s). The easement is to be granted to the local government and it is to agree with the landowner on the arrangements of the management of the easement area by deed. These management arrangements will be at the discretion of the local government. If gated, the easement area can be locked to restrict day-to-day vehicular access.  Figure 22: Example of an emergency access way

Through-roads
Acceptable solution A3.3
All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where: • it is demonstrated that no alternative road layout exists due to site constraints; and • the no-through road is a maximum length of 200 metres to an intersection providing two-way access, unless it satisfies the exempt ion provisions in A3.2a of this table. A no-through road is to meet all the following requirements: • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24
Explanatory note E3.3
In bushfire prone areas, a proposed structure plan or subdivision that incorporates no-through roads should be avoided because they do not provide a connected and legible design that allows for easy access and egress by the community, residents and emergency services in the event of a bushfire. No-through roads also reduce the options available for access and egress in the event of a bushfire emergency. There will however be situations where a subject site is accessed via an existing or proposed no-through road and alternative access cannot be provided. In these situations, the proponent should demonstrate to the decision-maker, that all efforts have been made with the local government and/or adjoining landowners to secure alternative public road access or an emergency access way and that a redesign has been explored. The bushfire planning practitioner may need to develop a performance principle-based solution or address the non-compliance and demonstrate to the decisionmaker why discretion should be exercised in accordance with section 2.6 of these Guidelines. No-through roads will only be considered an acceptable solution where it is demonstrated by the proponent, to the satisfaction of the decision maker, that a no through-road cannot be avoided due to site constraints. For example, the internal road design of a structure plan or subdivision where site constraints, such as a water body or Bush Forever, prevent the ability to create a through-road and a no through road may be a more appropriate road layout. No-through roads should be a maximum of 200 metres from the lot(s) boundary to an intersection where two-way access is provided and may only exceed 200 metres if it meets the provisions which allow for no-through roads greater than 200 metres in A3.2a.    Figure 23: Example of a site on a no-through road greater than 200 metres from the intersection, but within 200 metres of BAL-LOW

Through-roads
 Figure 24: Turn-around area dimensions for a no-through road

Perimeter roads
Acceptable solution A3.4a
Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions. A perimeter road is a public road and should be provided for greenfield or infill development where 10 or more lots are being proposed (including as part of a staged subdivision) with the aim of: • separating areas of classified vegetation under AS3959, which adjoin the subject site, from the proposed lot(s); and • removing the need for battle-axe lots that back onto areas of classified vegetation. A perimeter road is to meet the requirements contained in Table 6, Column 1. A perimeter road may not be required where: • the adjoining classified vegetation is Class G Grassland; • lots are zoned for rural living or equivalent; • it is demonstrated that it cannot be provided due to site constraints; or • all lots have frontage to an existing public road
Explanatory note E3.4a
Where a planning proposal includes the creation of 10 or more lots adjacent to each other, which adjoin classified vegetation under AS 3959 with the exception of Class G Grassland, as part of a greenfield development or large urban infill site, hazard separation and defendable space should be provided in the form of a perimeter road. Greenfield is 'undeveloped or minimally developed areas that have been identified for urban development'; and urban infill is 'the redevelopment of existing urban areas at a higher density than currently exists'. The creation of 10 or more lots includes cumulative subdivision applications where the subdivision application may be part of a staged subdivision. A perimeter road should be in accordance with the class of road as specified in the IPWEA Subdivision Guidelines, Liveable Neighbourhoods, Austroad Standards and/or any applicable standard in the local government area as per the requirements of a public road in Table 6, Column 1. As the road is likely to function as a key neighbourhood distributor, or similar, consideration should be given to the provision of additional width to allow for emergency services vehicles to stop and operate on the side of the perimeter road, whilst simultaneously proving for the evacuation of the community (Figure 20). When designing a strategic planning proposal and/or subdivision, creating a large setback between classified vegetation and proposed lots with a perimeter road, and orientating habitable buildings to front onto (rather than back onto) areas of vegetation has many benefits, including: • passive surveillance; • defendable space for firefighting and emergency management purposes; • reducing the potential radiant heat that may impact a habitable building in a bushfire event; • reducing the need for battle-axe lots; and • unconstrained public access/egress for the community in the event of a bushfire. In developments where no perimeter road exists, property defence in a bushfire event is difficult and can be impossible. Where proposed lots have frontage to an existing public road and abut the hazard at the rear or side, it may be an undesirable planning outcome to create lots which front the existing public road and back onto a perimeter road. In this instance, consideration should be given to a fire service access route. Refer to E3.4b below.

Perimeter roads
 Figure 25: Example of a perimeter road

Fire service access routes
Acceptable solution A3.4b
Where proposed lots adjoin classified vegetation under AS3959, and a perimeter road is not required in accordance with A3.4a, a fire service access route can be considered as an acceptable solution to provide firefighter access, where access is not available, to the classified vegetation. A fire service access route is to meet all the following requirements: • requirements in Table 6, Column 3; • be through-routes with no dead-ends; • linked to the internal road system at regular intervals, every 500 metres; • must be signposted; • no further than 500 metres from a public road; • if gated, gates must open the required horizontal clearance and can be locked by the local government and/or emergency services, if keys are provided for each gate; and • turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres.
Explanatory note E3.4b
Where a subdivision adjoins classified vegetation and where A3.2a has been satisfied, hazard separation and defendable space across multiple lots may be required in the form of a fire service access route. A fire service access route is not intended to provide residents and the general public with emergency egress and therefore is not a suitable second access or substitute for a public road. A fire service access route is to provide access for emergency services to classified vegetation for firefighting and fire management purposes. A fire service access route can be provided as either an easement in gross over private or Crown land, or ceded to the Crown as a reserve. In both approaches, the management of the fire service access route is by the local government as the grantee of the easement or management body of the reserve. Determining which approach to take is dependent on what the intended tenure of the fire service access route is, which is explained further below. The proponent must obtain written consent from the local government that the local government will accept care, control and management of the easement or reserve and agree to the terms of the Management Order Conditions (if applicable); this must be provided to the decision-maker prior to granting planning approval. The approach taken is at the discretion of the decision-maker and/or the local government. Consultation with Land Use Management at the Department of Planning, Lands and Heritage should also be considered if the land is to be ceded to the Crown or if the local government is uncertain of which approach to take. Where gates are used, these should be double gates wide enough to access the full required horizontal clearance and accommodate type 3.4 fire appliances with the design and construction to be approved by the relevant local government. Gates on fire service access routes may be locked to restrict access, provided a common key system is used, and such keys are made available for emergency services and designated fire officers within the local government area and/or surrounding district. Gates should be installed where fences cross fire service access routes. If an easement in gross is proposed, such arrangements for gates should be included in the deed of easement and be agreed to by the local government. Fire service access route to remain in private ownership of multiple landowners Where a fire service access route is proposed to traverse multiple private lots and they are intended to remain in the private ownership of the multiple landowners, it should be provided as an easement in gross under section 196 of the Land Administration Act 1997, to ensure accessibility for fire emergency services and not for use by the public. The easement is to be granted to the local government and/or public authority for firefighting and emergency management purposes. <u>Fire service access route to be created under State ownership</u> Where a fire service access route is proposed to traverse multiple private lots, but the decision-maker and/or local government prefer for the fire service access route to remain in one ownership under the State for management purposes, the fire service access route can be vested in the Crown under section 152 of the Planning and Development Act 2005 as a reserve, such land to be ceded free of cost without any payment or compensation by the Crown. The purpose of the reserve should be for a public purpose specified in the condition related to the subdivision, for example for vehicular access for emergency services and the local

Fire service access routes
government only, or for vehicular access for emergency services and the local government and recreation. A reserve for emergency services access and recreation can optimise the land-use as a dual purpose, where it provides vehicular access for emergency services, but can be accessed by the public (on foot) on a day-to-day basis as a recreation link. Appropriate signage will ensure the general public is aware of the purpose of the reserve. The approach taken is at the discretion of the decision-maker and/or local government.

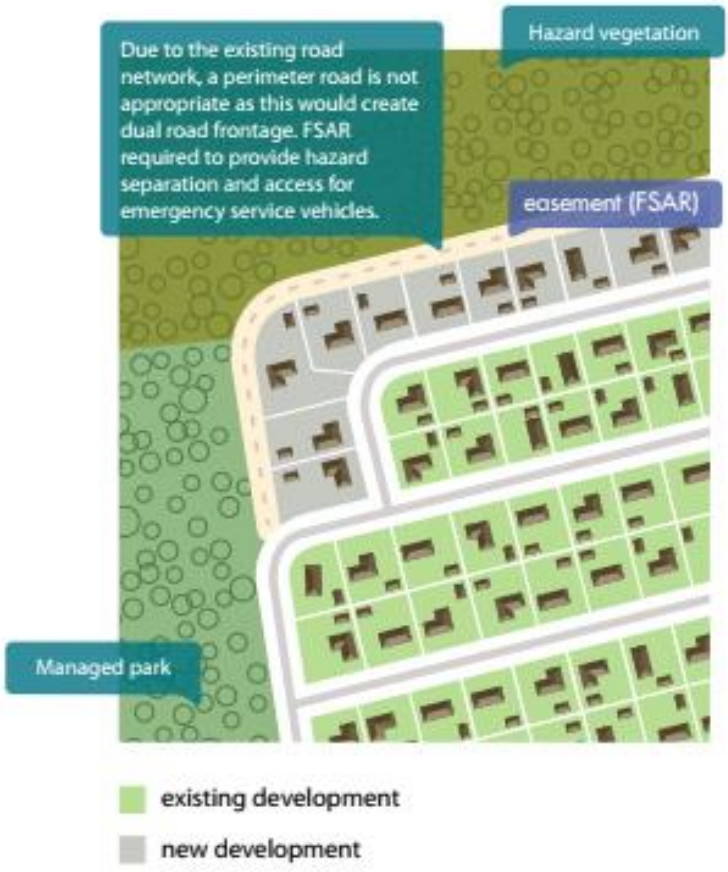


Figure 26: Example of a fire service access route

Battle-axe access legs
Acceptable solution A3.5
Where it is demonstrated that a battle-axe cannot be avoided due to site constraints, it can be considered as an acceptable solution. There are no battle-axe technical requirements where the point the battle-axe access leg joins the effective area of the lot, is less than 50 metres from a public road in a reticulated area. In circumstances where the above condition is not met, or the battle-axe is in a non-reticulated water area, the battle-axe is to meet all the following requirements: • requirements in Table 6, Column 4; and • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres)
Explanatory note E3.5
In bushfire prone areas, lots with battle-axe access legs should be avoided because they: • do not enable the habitable building to be located close to a public road where it is visible to emergency services; • result in longer than necessary access routes for evacuation and the response of emergency services; • may be blocked by falling trees or debris; and • may not provide certainty for emergency services regarding the width, length and ability to turn emergency services vehicle around. In some instances, it may be appropriate for battle-axe access legs to be used to overcome specific site or design constraints created by the existing road networks or lot layout. The Bushfire Management Plan should provide justification for proposed battle-axe access leg(s), including exploration of a redesign of the proposal, and the decision-maker should determine whether the justification is valid. The measurement of the battle-axe access leg should be from the edge of the public road to where the access leg joins the effective area of the lot. Effective lot area means that part of the battle-axe lot that is capable of development and excludes the access leg and associated truncations for vehicle manoeuvrability. Where a proposed battle-axe lot has an existing habitable building that will be retained, the private driveway requirements and/or the battle-axe requirements (as appropriate) should be satisfied. Battle-axe access should be 6 metres in width where the battle-axe is more than 50m in length or for lots serviced by a water source within the property, such as a water tank. It is acceptable for a single battle-axe to have a trafficable width of 4 metres with a traversable edge of 1 metre on either side of the carriageway

Battle-axe access legs

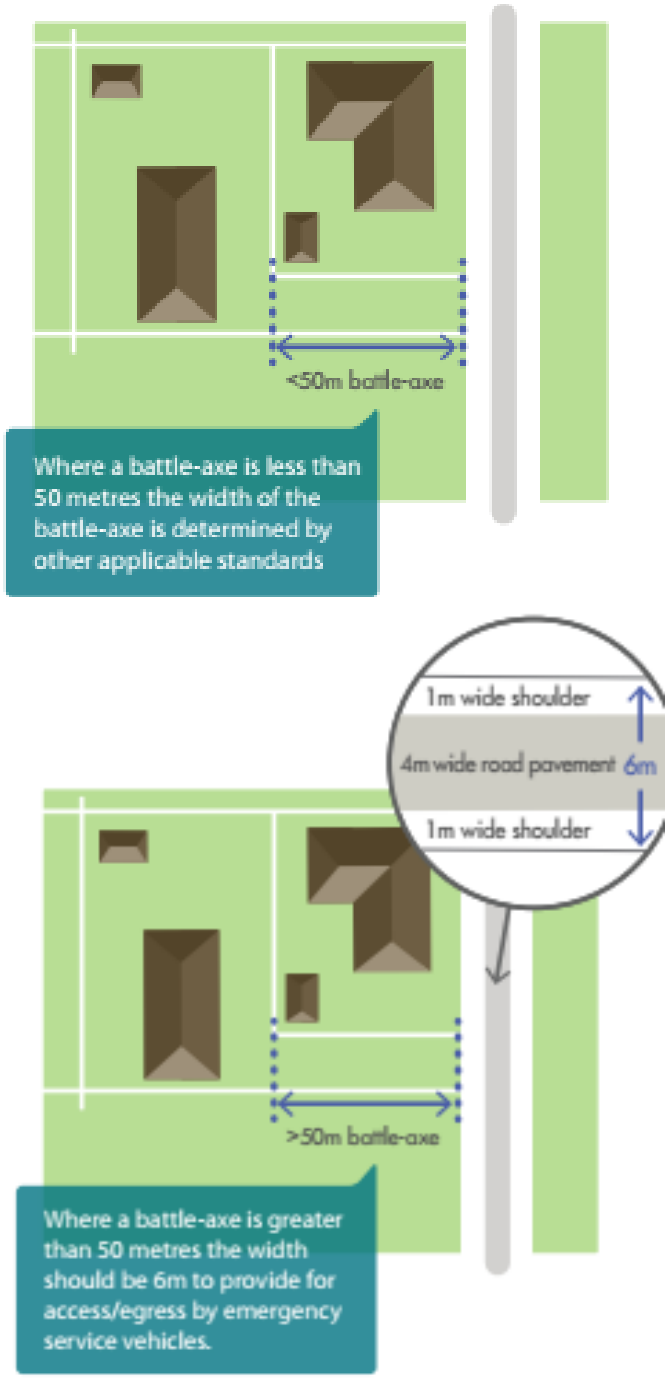


Figure 27: Battle-axe design requirements where required under A3.5

Private driveways
Acceptable solution A3.6
There are no private driveway technical requirements where the private driveway is: • within a lot serviced by reticulated water; • no greater than 70 metres in length between the most distant external part of the development site and the public road measured as a hose lay; and • accessed by a public road where the road speed limit is not greater than 70 km/h. In circumstances where all of the above conditions are not met, or the private driveway is in a non-reticulated water area, the private driveway is to meet all the following requirements: • requirements in Table 6, Column 4; • passing bays every 200 metres with a minimum length of 20 metres and a minimum additional trafficable width of two metres (i.e. the combined trafficable width of the passing bay and constructed private driveway to be a minimum six metres); and • turn-around area as shown in Figure 28 and within 30 metres of the habitable building.
Explanatory note A3.6
In areas serviced by reticulated water, where the road speed limit is not greater than 70 km/h, and where the distance from the public road to the further part of the habitable building is no greater than 70 metres, emergency service vehicles typically operate from the street frontage. In the event the habitable building cannot be reached by hose reel from the public road, then emergency service vehicles will need to gain access within the property. Emergency service vehicles will also need to gain access within the property, where access to reticulated water (fire hydrants) is not possible. In these situations, the driveway and battle-axe (if applicable) will need to be wide enough for access for an emergency service vehicle and a vehicle to evacuate. Turnaround areas should be available for both conventional two-wheel drive vehicles of residents and Type 3.4 fire appliances. Turn-around areas should be located within 30 metres of habitable buildings. Circular and loop driveway design may also be considered. Note that the design requirements for a turn-around area for a private driveway or battle-axe differ to a cul-de-sac.

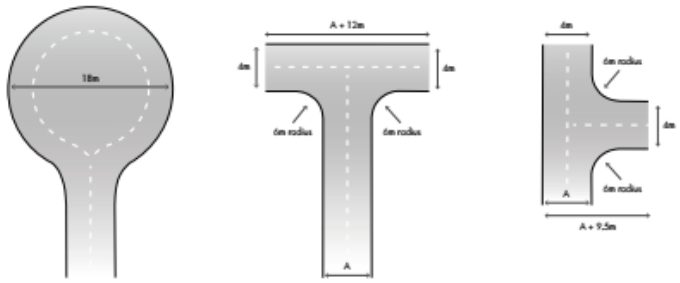


Figure 28: Design requirements for a turn-around area for a private driveway or battle-axe

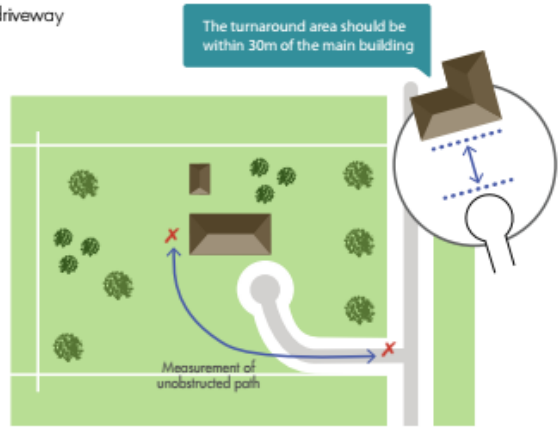


Figure 29: Design requirements for a private driveway where required under A3.6

Technical requirement	1	2	3	4
	Public road	**Emergency access way[1]**	**Fire service access routes[1]**	**Battle-axe and private driveways[2]**
Minimum trafficable surface (m)	In accordance with A3.1	6	6	4
Minimum horizontal distance (m)	N/A	6	6	6
Minimum vertical clearance (m)	4.5			
Minimum weight capacity (t)	15			
Maximum grade unsealed road [3]	As outlined in the IPWEA Subdivision Guidelines	1 in 10 (10%)		
Maximum grade sealed road [3]		1 in 7 (14.3%)		
Maximum average grade sealed road		1 in 10 (10%)		
Minimum inner radius of road curves (m)		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

Appendix 5 Water technical standards of the Guidelines

Schedule 2 – Water Supply Dedicated for Bushfire Fighting Purposes

2.1 Water supply requirements

Water dedicated for firefighting should be provided in accordance with Table 7 below, and be in addition to water required for drinking purposes.

Table 7: Water supply dedicated for bushfire firefighting purposes

PLANNING APPLICATION	NON-RETICULATED AREAS
Development application	10,000L per habitable building
Structure Plan / Subdivision: Creation of 1 additional lot	10,000L per lot
Structure Plan / Subdivision: Creation of 3 to 24 lots	10,000L tank per lot **or** 50,000L strategic water tank
Structure Plan / Subdivision: Creation of 25 lots or more	50,000L per 25 lots or part thereof Provided as a strategic water tank(s) or 10,000L tank per lot

2.2 Technical requirements

2.2.1 Construction and design

An above-ground tank and associated stand should be constructed of non-combustible material. The tank may need to comply with AS/NZS 3500.1:2018.

Below ground tanks should have a 200mm diameter access hole to allow tankers or emergency service vehicles to refill direct from the tank, with the outlet location clearly marked at the surface. The tank may need to comply with AS/NZS 3500.1:2018. An inspection opening may double as the access hole provided that the inspection opening meets the requirements of AS/NZS 3500.1:2018. If the tank is required under the BCA as part of fire hydrant installation, then the tank will also need to comply with AS 2419.

Where an outlet for an emergency service vehicle is provided, then an unobstructed, hardened ground surface is to be supplied within four metres of any water supply.

2.2.2 Pipes and fittings

All above-ground, exposed water supply pipes and fittings should be metal. Fittings should be located away from the source of bushfire attack and be in accordance with the applicable section below, unless otherwise specified by the local government.

2.2.2.1 Fittings for above-ground water tanks:

- Commercial land uses: 125mm Storz fitting; or
- Strategic water tanks: 50mm or 100mm (where applicable and adapters are available) male camlock coupling with full flow valve; or
- Standalone water tanks: 50mm male camlock coupling with full flow valve; or
- Combined water tanks: 50mm male camlock coupling with full flow valve or a domestic fitting, being a standard household tap that enables an occupant to access the water supply with domestic hoses or buckets for extinguishing minor fires.

2.2.2.2 Remote outlets

In certain circumstances, it may be beneficial to have the outlet located away from the water supply. In such instances in which a remote outlet is to be used, the applicant should consult the local government and DFES on their proposal.

Appendix 6 City of Wanneroo Firebreak Notice

City of Wanneroo

IMPORTANT
FIRE MITIGATION NOTICE

Fire mitigation measures must be in place by 1 NOVEMBER and maintained until 30 APRIL EACH YEAR.

This is a requirement under the Bush Fires Act 1954 Section 33.

Failure to comply with this Notice may incur penalties of up to $5,000 and the works required by this Notice will be carried out at the expense of the owner/occupier.

Fire management requirements for land LESS than 4000sqm

- Maintain grasses and inflammable materials with the exception of living trees on the entire property to a height of no more than 50 millimetres. The entire property is required to be maintained below 50 millimetres from 1 November each year until 30 April the following year.

  OR

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.
  - If it is not possible to install the firebreak adjacent to the external boundary of the property due to naturally occurring obstacles, it is acceptable to install the firebreak around the obstacle. If this requires the firebreak to be greater than 5 metres away from the external boundary, a firebreak variation is required.
  - Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to enable vehicles to drive along the firebreaks without access being obstructed.
- Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this Notice and with any additional requirements outlined within that plan.

Fire management requirements for land GREATER than 4000sqm

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.
  - If it is not possible to install the firebreak adjacent to the external boundary of the property due to naturally occurring obstacles, it is acceptable to install the firebreak around the obstacle. If this requires the firebreak to be greater than 5 metres away from the external boundary, a firebreak variation is required.
  - Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to enable vehicles to drive along the firebreaks without access being obstructed.
- Install and maintain a 20 metre bare earth area around all hay stacks and/or fuel dumps.
- Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this Notice and with any additional requirements outlined within that plan.

Important Fire Mitigation Notice

All vacant land GREATER than 4000sqm

- A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.
- Ensure a minimum vertical clearance of 4 metres is maintained along the firebreaks to ensure vehicles can drive along the firebreaks without being impeded by tree branches.
- If the land is an area of 50,000sqm (5 hectares) or greater, the grass must be maintained on the land to a height no greater than 50 millimetres for a distance of 10 metres from any firebreak.

Frequently asked questions

I live in a residential area, does this notice apply to me?

Yes. All City of Wanneroo property owners must comply with the Bush Fires Act 1954.

Please refer overleaf for fire management requirements to be in place by 1 November to ensure your property is compliant.

Most properties under 1000sqm will automatically comply if gardens are maintained.

How will inspections be carried out?

Inspections will be carried out by trained Fire Control Officers who are authorised to enter a property by foot, vehicle, quad bike and /or drone.

Do I need a Bushfire Survival Plan?

If you live in, on or near bushland, you are at risk from a bushfire and developing a bushfire survival plan is critical.

Visit the Department of Fire and Emergency Services website for information on how to develop a plan for your property **dfes.wa.gov.au**

I am concerned my neighbour's property is not compliant, what can I do?

All properties are required to be compliant by 1 November.

If you think your neighbour's property does not comply with the requirements as outlined in this Notice, please contact the Community Safety and Emergency Management team on **9405 5000**.

I own a vacant lot, do I need a firebreak?

Yes. A 3 metre wide trafficable firebreak as close as possible to all external boundaries of the property must be installed by 1 November each year and maintained until 30 April the following year.

I am unable to meet the requirements outlined, what should I do?

If it is considered impracticable for any reason to implement any of the requirements of this Notice, an application for a firebreak variation must be made to the City of Wanneroo by no later than 18 October of each year.

If permission is not granted, the requirements of this Notice must be complied with.

Visit the City's website **wanneroo.wa.gov.au/firebreakvariation** to apply for a variation.

Where can I learn more about this Notice and bushfire management?

Visit the City's website **wanneroo.wa.gov.au/fireinformation** to learn more.

Please note, in addition to the requirements of this Notice, if a City of Wanneroo Fire Control Officer considers further works are necessary to reduce the risk of bushfire, Landowners will be notified via letter to the address shown on the City of Wanneroo rates record for the relevant land.

For further information call the City of Wanneroo Community Safety and Emergency Management Team on **9405 5000** or visit **wanneroo.wa.gov.au/fireinformation**

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TO REPORT ALL FIRES CALL 000