



Shire of
Serpentine
Jarrahdale

Bushfire Management Plan

West Mundijong Industrial Structure Plan

LUSHFIRE & PLANNING

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Ref 22 - 003
Version A
May 2022

Bushfire Management Plan Coversheet

This Coversheet and accompanying Bushfire Management Plan has been prepared and issued by a person accredited by Fire Protection Association Australia under the Bushfire Planning and Design (BPAD) Accreditation Scheme.

Bushfire Management Plan and Site Details

Site Address / Plan Reference:	Various lots bounded by Mundijong, Kargotich, Bishop Roads and Tonkin Highway.		
Suburb:	West Mundijong	State:	WA
		P/code:	6121
Local government area:	Serpentine Jarrahdale		
Description of the planning proposal:	Local Structure Plan		
BMP Plan / Reference Number:	22-003	Version:	A
		Date of Issue:	23/05/2022
Client / Business Name:	Shire of Serpentine Jarrahdale		

Reason for referral to DFES

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Is the proposal any of the following special development types (see SPP 3.7 for definitions)?

Unavoidable development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Strategic planning proposal (including rezoning applications)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minor development (in BAL-40 or BAL-FZ)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High risk land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Vulnerable land-use	<input type="checkbox"/>	<input checked="" type="checkbox"/>

If the development is a special development as listed above, explain why the proposal is considered to be one of the above listed classifications (E.g. considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

Note: The decision maker (e.g. the local government or the WAPC) should only refer the proposal to DFES for comment if one (or more) of the above answers are ticked "Yes".

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Geoffrey Lush	Level 2	BPAD 27682	28/02/2023
Company	Contact No.		
Lush Fire & Planning	0418 954 873		

I declare that the information provided in this bushfire management plan is to the best of my knowledge true and correct.

Signature of Practitioner



Date

23/05/2022

West Mundijong Industrial Structure Plan - Executive Summary

This bushfire management plan is prepared for the proposed subdivision and development of the West Mundijong Industrial Structure Plan area.

The subject land is located approximately 2 kilometres west of the Mundijong townsite and is bounded by Mundijong Road (south), Tonkin Highway Road reserve (east), Kwinana freight rail (north) and Kargotich Road (west).

The subject land has an area of approximately 474 hectares and is approximately 1.5km wide extending for 3.2kms along Kargotich Road. There are approximately 30 existing lots within the subject land varying in size from 2 to 112 hectares. The majority of the site is still used for agricultural purposes typically being broad acre grazing. It is characterised by large open paddocks with scattered trees and linear vegetation along both constructed and unconstructed road reserves.

Manjedal Brook crosses the northern portion of the site and Bush Forever Site No 360 extends along Mundijong Road. A 330kV transmission line extends along the western boundary parallel to Kargotich Road. There is no reticulated water supply to the subject land.

All of the subject land is designated as being bushfire prone land.

The West Mundijong Industrial Area Local Structure Plan was adopted by the Shire at its Meeting of the 15 March 2021 and is subject to final approval by the Planning Commission. The subject land is designated as Development Area 6 in the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2. Subdivision and development is required to comply with approved local structure plan(s).

The subdivision of the subject land is expected to occur in two stages as follows:

- Stage 1 (20 years) will only allow subdivision to minimum of 1.5 - 2ha for dry industries as there is no reticulated water supply; and
- Stage 2 will allow for further subdivisions of smaller lots with a minimum size of 0.4ha which are fully serviced.

This Bushfire Management Plan only relates to Stage 1 and this will potentially provide for up to 127 lots. The plan makes provision for a multiple use corridor between Kargotich Road and the overhead 330 kV transmission line. There are also two ecological corridors running east / west through the site.

A Bushfire Hazard Level Assessment has been prepared and the majority area of the lots will have a Low Hazard rating with the peripheral areas having a Moderate Hazard rating.

A Bushfire Attack Level (BAL) Assessment has been prepared and shown as a BAL Contour Plan, noting that the proposed subdivision design and layout is still indicative. The major portion of all of the proposed lots have either a BAL- 12.5 or a BAL - Low rating. Multiple lots may potentially have a BAL - 40/FZ encroachment of up to 21m as shown below. This will be from bushland along the existing road verges or the multiple use corridors.

The surrounding land is a mixture of industrial, commercial, residential, rural residential, and rural land uses. This has a moderate to extreme bushfire hazard level with Melaleuca scrub vegetation being the most prominent vegetation class. The primary bushfire hazard is from a fast moving grass fire which can still have the potential to be a destructive fire threatening life and property.

When the site when fully developed will have limited internal access to the east due to the railway line deviation and Tonkin Highway extension. The internal subdivision roads provide "loop" connections back to the main north - south spine road. However, the subject land extends for approximately 500m east of the spine road, which may create access issues from a fire coming from a westerly direction. It is also noted that the major portion of the development will have either a low Bushfire Hazard Level or a BAL - Low rating.

This report demonstrates that the hazard level on the subject land will be reduced and permanently altered by the site being developed.

West Mundijong Industrial Structure Plan - Executive Summary

The proposed subdivision complies with the objectives of State Planning Policy 3.7 as:

- 1. It avoids any increase in the threat of bushfire to people, property and infrastructure.**
Land is considered suitable for land use intensification as the bushfire hazard levels are moderate and low. The proposed development (building) sites will have a BAL rating of BAL-29 or less.
- 2. It reduces vulnerability to bushfire through the identification and consideration of bushfire risks in the design of the development and the decision-making process.**
The bushfire hazard and risks have been identified and assessed in this report. It documents how the hazard level will be reduced and maintained for the life of the development and defines the responsibilities of relevant stakeholders.
- 3. The design of the subdivision and the development takes into account bushfire protection requirements and includes specific bushfire protection measures.**
The proposed management/mitigation measures to be implemented in accordance with this Bushfire Management Plan demonstrate that the acceptable solutions within each element of the Bushfire Protection Criteria as contained in the Guidelines for Planning in bushfire Prone Areas (Version 1.4 December 2021) will be given due regard.
- 4. Achieves an appropriate balance between bushfire risk management measures and biodiversity, conservation values, and environmental protection.**
The modification of remnant vegetation for the development is in accordance with the previous environmental assessments for the rezoning of the land.

West Mundijong Industrial Structure Plan

Document Control

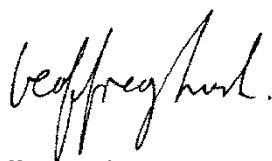
Street No	Lot No	Plan	Street Name		
	Various		Mundijong, Kargotich, Bishop Roads and Tonkin Highway extension.		
Locality	West Mundijong	State WA	Postcode	6121	
Local Government Area	Serpentine Jarrahdale				
Project Description	Local Structure Plan				
Prepared for	Shire of Serpentine Jarrahdale				

Ref No	Revision	Date	Purpose
22-003	A	23 May 2022	Preliminary

Name	Geoffrey Lush	Company	Lushfire & Planning
BPAD	Level 2 Practitioner	Accreditation No Expiry	27682 February 2023

Disclaimer

The measures contained in this report do not guarantee that a building will not be damaged in a bushfire. The ultimate level of protection will be dependent upon the design and construction of the dwelling and the level of fire preparedness and maintenance under taken by the landowner. The severity of a bushfire will depend upon the vegetation fuel loadings; the prevailing weather conditions and the implementation of appropriate fire management measures. All information and recommendations made in this report are made in good faith based on information and accepted methodology used at that time. All plans are subject to survey and are not to be used for calculations. Notwithstanding anything contained therein, Lushfire & Planning will not, except as the law may require, be liable for any loss claim, damage, loss or injury to any property and any person caused by fire or by errors or omissions in this report.



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23 May 2022
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West Mundijong Industrial Structure Plan

1.0 Proposal Details

1.1 Introduction

This bushfire management plan is prepared for the proposed subdivision and development of the West Mundijong Industrial Structure Plan area.

The subject land is located approximately 45 kilometres southeast of the Perth Central Business District and it is situated to the west of the Mundijong townsite as shown in Figure 1. It is bounded by Mundijong Road (south), Tonkin Highway Road reserve (east), Kwinana freight rail (north) and Kargotich Road (west).

The Structure Plan has been developed to formulate and guide future subdivision, land use and development for Industrial, Light Industrial and Service Commercial land uses.

The objectives of this report are to:

- a) Identify any bushfire management issues and how these should be managed; and
- b) Demonstrate that development will comply with State Planning Policy SPP3.7 Planning in Bushfire Prone Areas; the associated Guidelines and Bushfire Protection Criteria now and/or in subsequent planning stages.

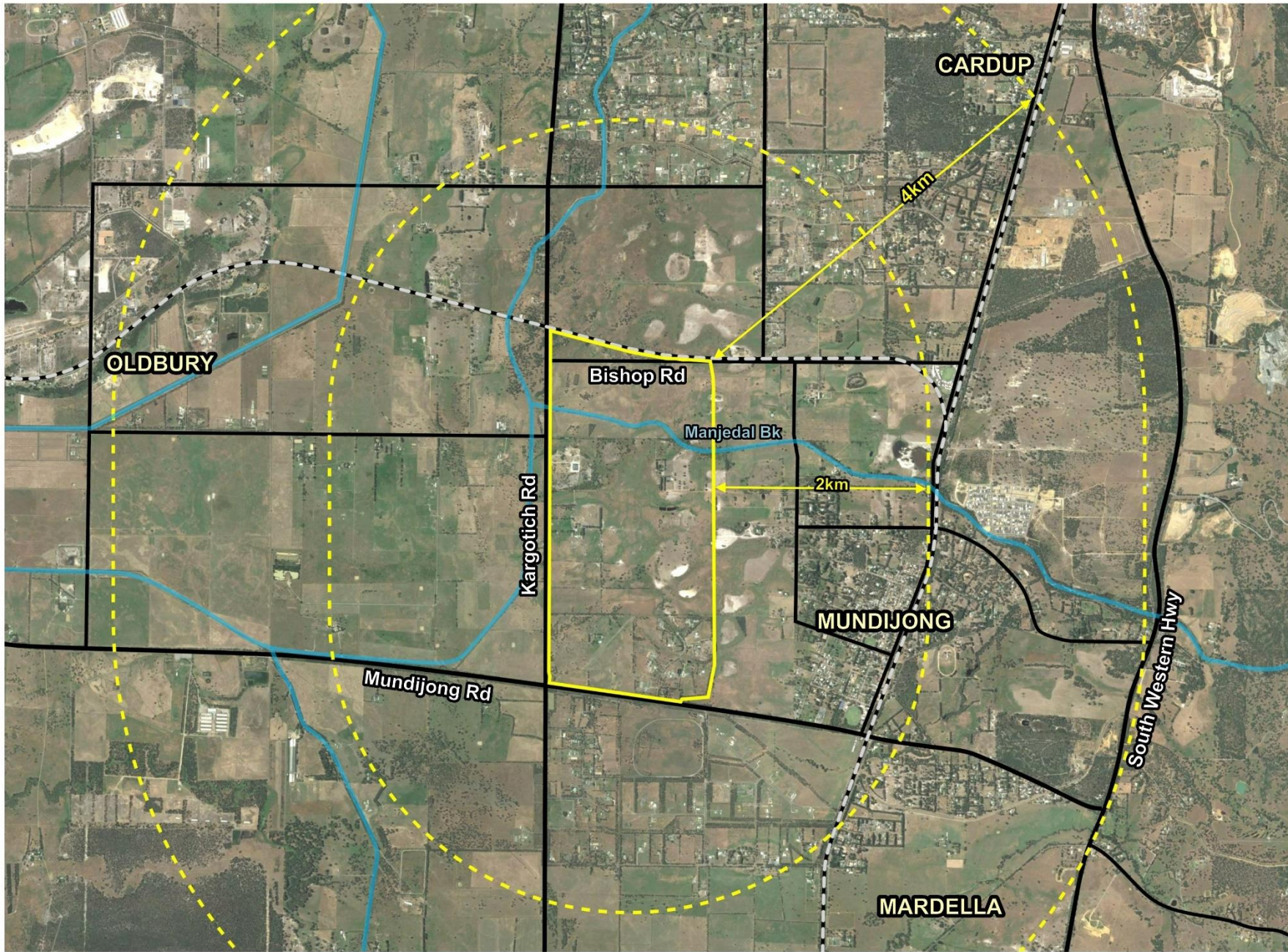
Previous bushfire hazard level assessments have been prepared for the structure plan but are now out dated being:

- Calibre Consulting (July 2015); and
- Bushfire Prone Planning (November 2016)

The Guidelines for Planning Bushfire Prone Areas contains in Appendix 5, a checklist for the preparation of Bushfire Management Plans as shown in Table 1 below. It notes that where the lot layout has been determined, a BAL contour map showing the BAL ratings for each lot should be prepared instead of a BHL assessment.

Table 1 BMP Checklist

SECTIONS	Structure Plans	Subdivision	Development Approval
Coversheet	Yes	Yes	Yes
Executive Summary	Optional	Optional	Optional
1.0 Proposal details	Yes	Yes	Yes
2.0 Environmental considerations	Yes	Yes	Yes
3.0 Bushfire assessment results			
3.1 Assessment inputs	Yes	Yes	Yes
3.2 Assessment outputs			
BHL assessment	Yes		
BAL contour map	Yes	Yes	
BAL assessment		Yes	Yes
4.0 Bushfire hazard issues	Yes	Yes	Yes
5.0 Assessment against Bushfire Protection Criteria	Yes	Yes	Yes
6.0 Implementation	Yes	Yes	Yes



LEGEND

- SUBJECT LAND —
- RAILWAY LINE
- DRAINAGE LINE —

FIGURE 1
LOCATION & CONTEXT

1.2 Existing Conditions

The subject land has an area of approximately 474 hectares and is approximately 1.5km wide extending for 3.2kms along Kargotich Road. There are approximately 30 existing lots within the subject land varying in size from 2 to 112 hectares. The existing cadastral information is shown in Figure 2.

The existing conditions for the subject land and surrounding are shown in Figure 3 and the following photographs.

The majority of the site is still used for agricultural purposes typically being broad acre grazing. It is characterised by large open paddocks with scattered trees and linear vegetation along both constructed and unconstructed road reserves.

There is an existing rural residential subdivision in the south eastern corner of the site on Pure Steel Lane. The Kwinana freight railway line extends along the northern boundary.

Manjedal Brook crosses the northern portion of the site and Bush Forever Site No 360 extends along Mundijong Road. A 330kV transmission line extends along the western boundary parallel to Kargotich Road. There is no reticulated water supply to the subject land.

The boundary roads are all sealed with Mundijong Road providing access to the Kwinana Freeway and South Western Highway. Kargotich Road is also a district distributor road extending from Lowlands Road, Mardella to Rowley Road, South Forrestdale.

The subject land has elevations of between 16.5m AHD in the south west corner rising to approximately 27 metres AHD for a sandy ridge in the middle of the site near the eastern boundary. Generally, the slopes are less than 1.0% and are considered to be flat.

The vegetation on the site is described as (1):

- Completely cleared containing pasture grasses, which is the predominant vegetation type over the entire site;
- *Casuarina obesa* (Sheoak) Woodland over pasture grasses which is dominant in the south western corner of the site;
- *Melaleuca raphiophylla* (Paperbark) Woodland over pasture grasses which is associated with the Conservation Category Wetland and has some *Eucalyptus rudis* (Flooded Gum).
- *Corymbia calophylla* Woodland over pasture grasses which is mainly in the area around Scott Road.
- *Kingia australis* and *Melaleuca raphiophylla* over pasture grasses, which occurs in the north of the site near Bishop Road.

Australian native trees and shrubs have been planted in road reserves and paddock fence-lines including Rose Gums (*Eucalyptus grandis*), Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Mahogany (*E. robusta*) and River Red Gum (*E. camaldulensis*).

Two subdivision applications have been approved within the structure plan area being WAPC Ref No's:

- 159480 - Lot 12 Kargotich Road and Lot 14 Scott Road; and
- 156950 - Lots 180 and 402 Scott Road.

LEGEND

SUBJECT LAND

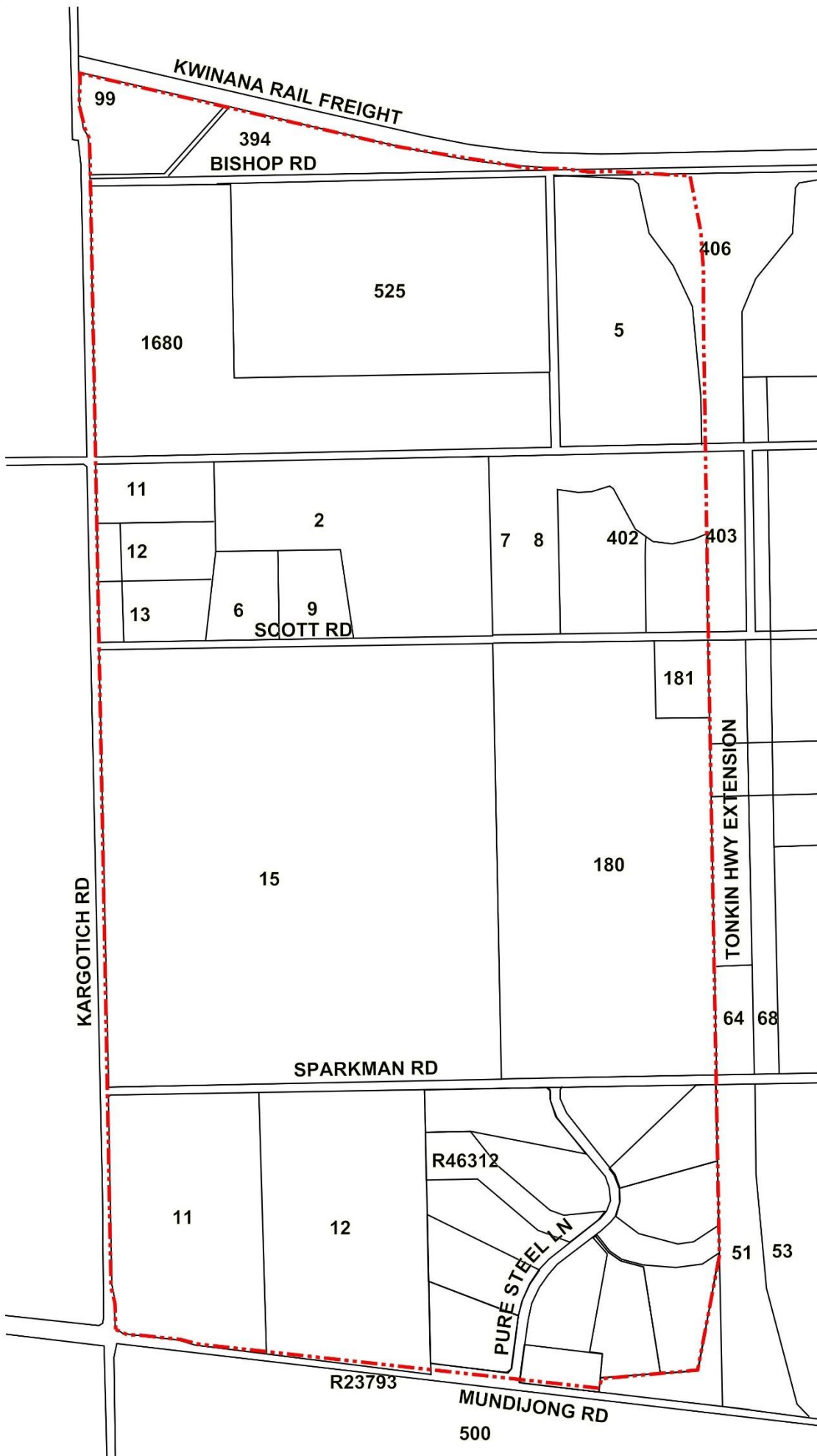


FIGURE 2
CADASTRAL PLAN



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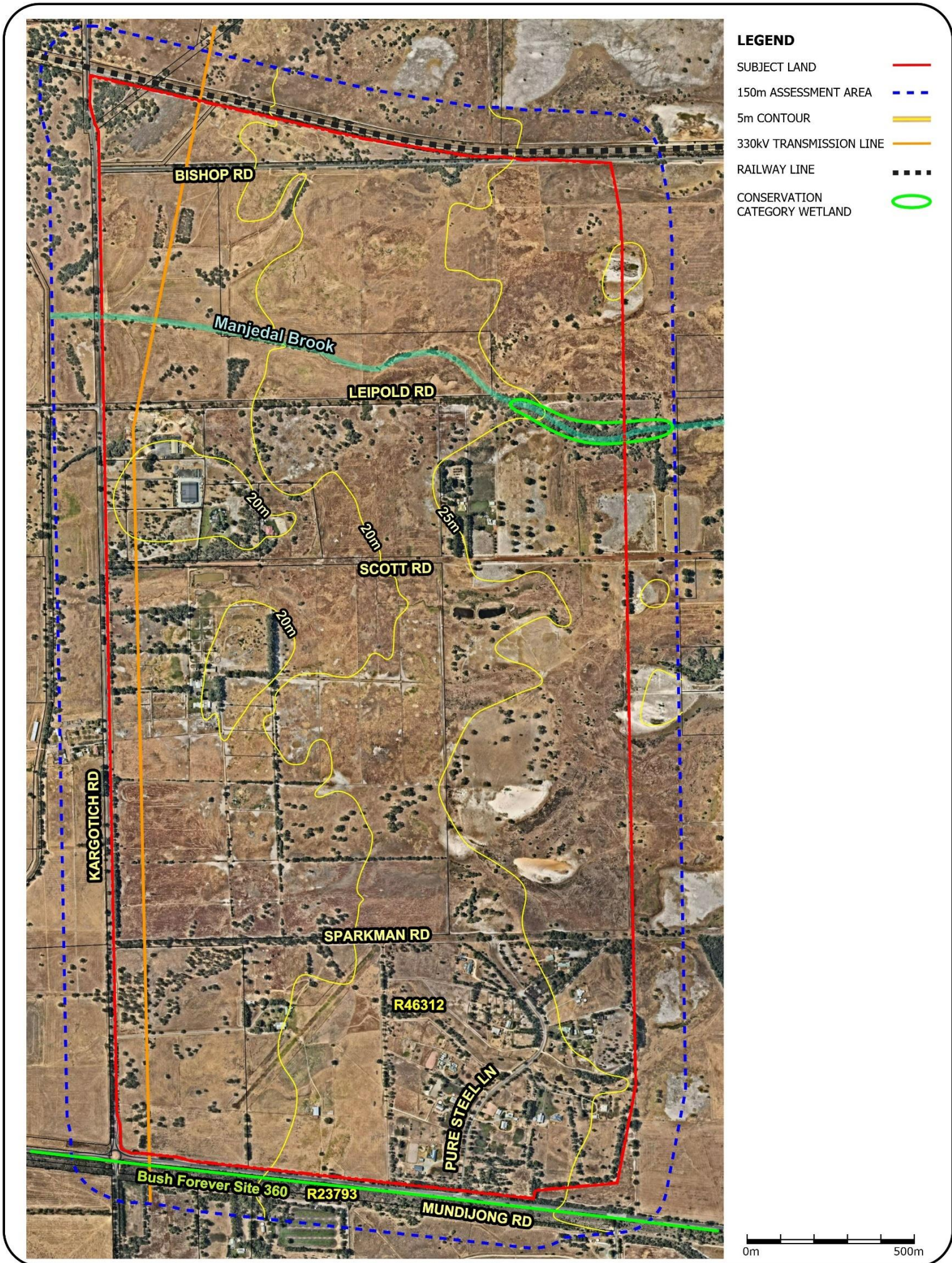
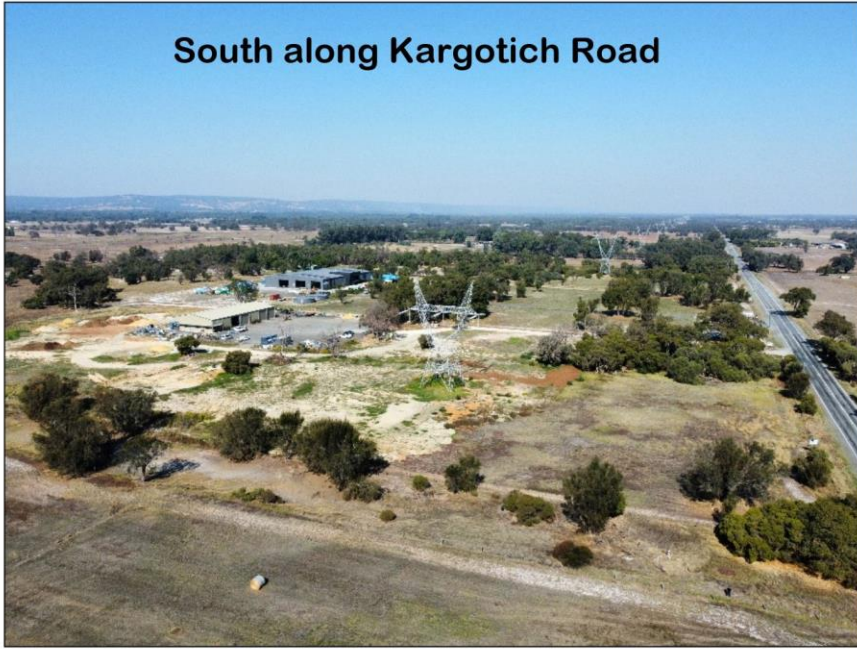


FIGURE 3
EXISTING CONDITIONS

South along Kargotich Road



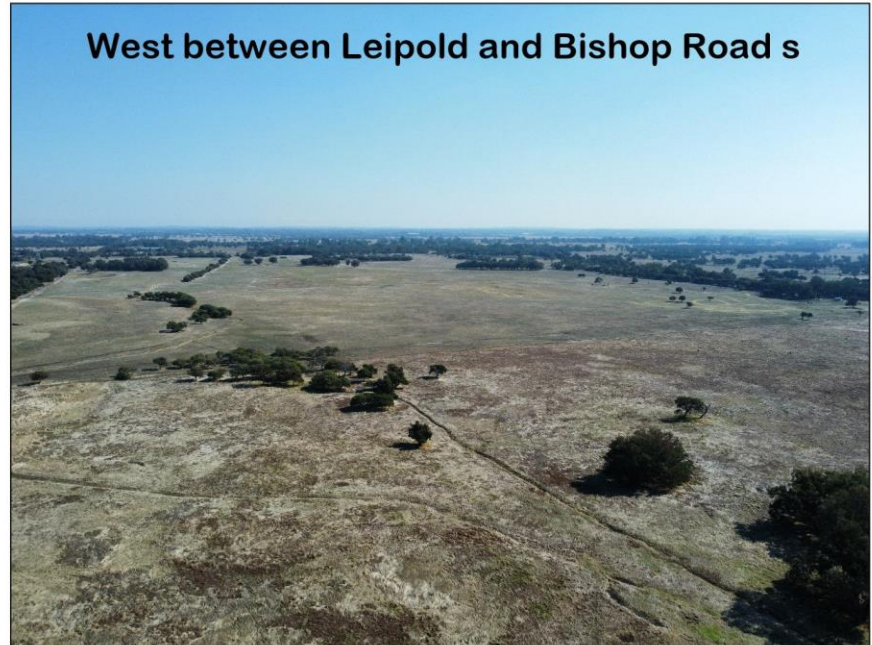
South along Tonkin Hwy reserve



**West along Leipold Road reserve
and Manjedal Brook**



West between Leipold and Bishop Road s



**Rural residential lots
Pure Steel Lane**



**South west from Sparkman Road
towards Kargotich / Mundijong**



West, north of Sparkman Road



North along Tonkin Hwy reserve



1.3 Bushfire Prone Land

All of the subject land is designated as being bushfire prone land and this designation triggers:

- The application of Australian Standard AS3959 Construction of Buildings in Bushfire Prone Areas under the Building Code of Australia;
- The provisions of the Planning and Development (Local Planning Schemes) Regulations 2015; and
- The application of State Planning Policy SPP3.7 Planning in Bushfire Prone Areas.

State Planning Policy SPP3.7 Planning in Bushfire Prone Areas requires that any structure plan or subdivision application must be accompanied by a bushfire management plan which includes:

- a) a Bushfire Attack Level (BAL) Assessment or a BAL Contour Map to show the expected BAL ratings for the developed site. The BAL Contour Map shows the proposed BAL ratings based upon any clearing or landscaping;
- b) the identification of any bushfire hazard issues arising from the BAL Contour Map or the BAL assessment; and
- c) an assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance within the boundary of the development site.

1.4 Fire Hazard Reduction Notice

The Shire's 2021 - 2022 1.5 Fire Hazard Reduction Notice requires the following measures for land greater than 4047m² (one acre)

- ❖ Fire Breaks
Install or upgrade a 3-metre-wide by 4-metre-high clearance, bare mineral earth, continuous (no dead ends) trafficable fire break as close as possible inside the entire perimeter of the land. Maintained, reticulated living lawns that are kept completely green is acceptable in conjunction with, or in lieu of, a mineral earth fire break/s (see definition Fire Break).
- ❖ Dead Flammable Material (DFM)
Reduce and/or maintain all dead flammable material below 8 tonne per hectare (see definition Fuel Load).
- ❖ Slashing
Slash, mow, or trim dead grasses, dead shrubs, and dead plants to a height no greater than 50mm and remove cuttings/swath across the entire property.
- ❖ Asset Protection Zone
Maintain a fuel reduced zone around all buildings or assets which extends 20 metres from the outermost point of the building or asset.
 - » Gutters, roofs, and walls of all buildings to be free of flammable matter and maintained.
 - » Fuel load within the 20-metre zone is reduced and maintained to no more than 2 tonne per hectare.
 - » Trees over 5 metres in height within the 20-metre zone to be under pruned up to 2 metres.
 - » Trees or shrubs within 2 metres of the asset shall be pruned to a height no greater than 2 metres and/or pruned away from the asset to a distance no greater than 2 metres.

All properties and/or land subject to an approved Bushfire Management Plan must comply with those requirements.

1.5 Town Planning

1.5.1 Local Planning Strategy

The Shire's Local Planning Strategy was endorsed by the Western Australian Planning Commission 18th March 2022. The Strategy identifies the subject land as a proposed industrial area.

Natural Landscape and Bushfire Risk issues are contained in Section 5.4.1 and the objectives include to:

- Ensure the safety of the community from bushfire risk; and
- Achieve a balance between managing bushfire risk and preserving natural landscapes, the environment and biodiversity values

Table 26: of the Strategy has the following Strategy and Actions

STRATEGY	ACTION
d. Where development is proposed in the vicinity of bushland with regional or local values, there is a presumption that any buildings will be constructed to the appropriate Bushfire Attack Level (BAL).	4. Undertake bushfire hazard assessments as per SPP3.7 at structure planning, subdivision and development stages.
e. Not support the broad-scale clearing of vegetation as a means of addressing bushfire risk.	
f. Ensure future planning and development identified and appropriately manages bushfire risk.	

1.5.2 West Mundijong Industrial Area Local Structure Plan

The West Mundijong Industrial Area Local Structure Plan was adopted by the Shire at its Meeting of the 15 March 2021 and is subject to final approval by the Planning Commission. It is shown in Figure 4 and the objectives of the structure plan are:

Industrial land use

- ❖ To provide for a first phase dry lot industrial outcome, with preferred land uses set, and a minimum lot size of 1.5 - 2ha;
- ❖ To provide for an ultimate fully surfaced second phase nonheavy industrial outcome, compatible with existing and planned adjoining land use;

Transport

- ❖ Provide for a distributor road network designed to enable efficient movement of commercial vehicles within the Estate and to and from the Estate via the existing and planned district and sub-regional road framework;
- ❖ To fully optimize the potential of key transport initiatives, including extension of Tonkin Highway, possible realignment of the Kwinana freight rail and a possible intermodal facility;

Environment & Sustainability

- ❖ Creation of ecological corridors with the potential to facilitate drainage, environmental rehabilitation, conservation of wetlands and passive recreation where practical;
- ❖ Creation of an accessible centre that meets the employment requirements of future neighbouring and district residential areas;
- ❖ Provision for future access to sustainable transport modes, such as a possible freight rail line and associated intermodal facility;
- ❖ The need for a comprehensive district drainage framework which balances agency requirements with the objective of realizing the optimum development potential of the land;

Further details and provisions relating to the structure plan are outlines in Section 1.6.

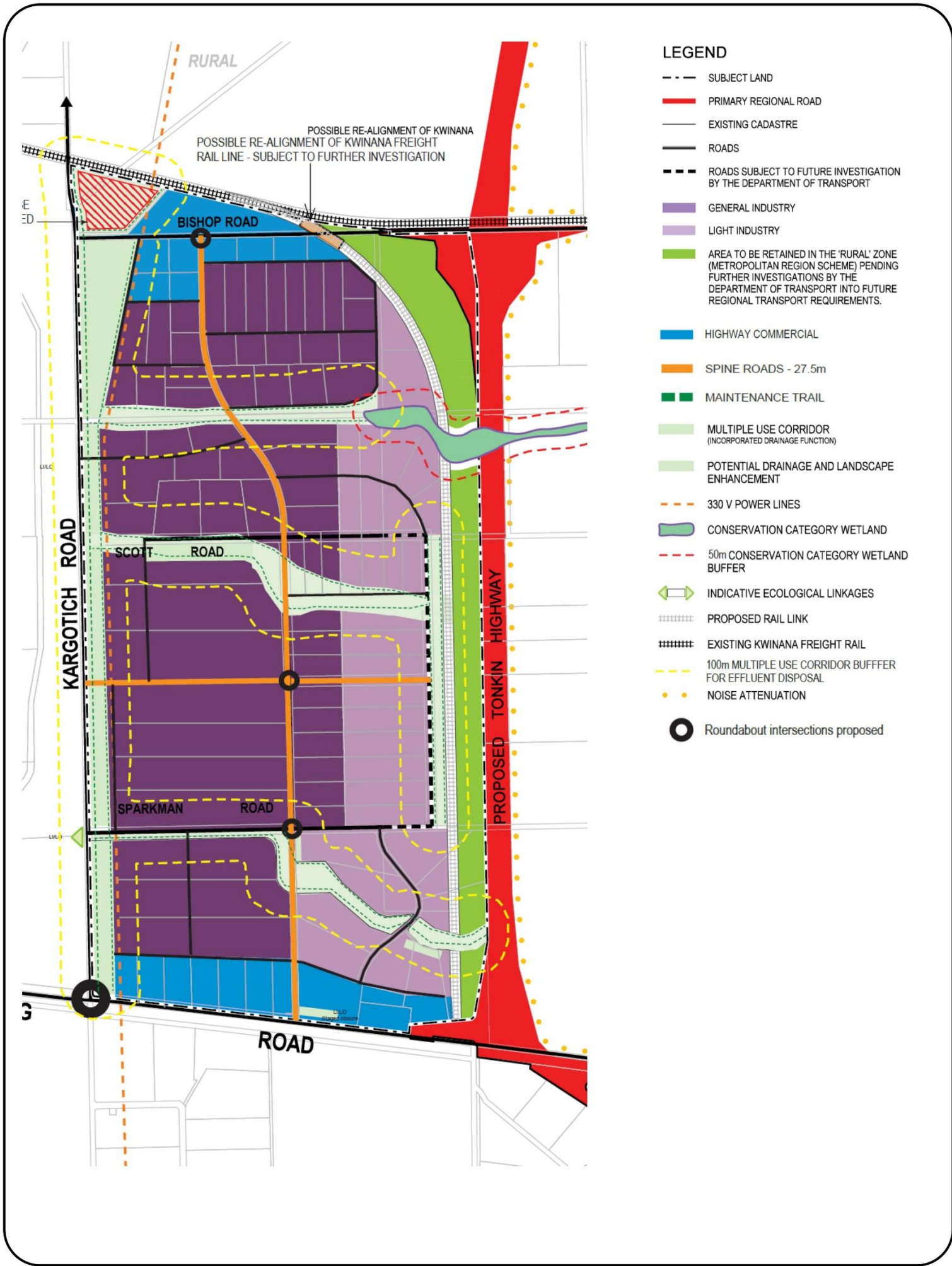


FIGURE 4
LOCAL STRUCTURE PLAN

1.5.3 Town Planning Scheme No 2

The subject land is designated as Development Area 6 in the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2. Subdivision and development is subject to the provisions of Appendix 9 of the Scheme.

This requires compliance with approved local structure plan(s) and the preparation of a Local Water Management Strategy and appropriate level Bushfire Risk Management Planning. The local structure plan is also to address:

- a) Proposed extension of Tonkin Highway.
- b) Possible realignment of the Kwinana Freight line.
- c) Provision of a possible intermodal facility if found feasible by the Department of Transport.
- d) Conservation of Manjedal Brook.
- e) Preparation and implementation of a noise management strategy to the satisfaction of the Office of Environmental Protection which is cognisant of proposed and existing sensitive uses including those existing uses contained within the structure plan area.
- f) Provision of ecological corridors reflecting district drainage patterns, vegetation and wetland values within the amendment area.
- g) Inclusion of a 50 metre buffer around the Conservation Category Wetland unless a specific site study is undertaken and recommends a revision of this buffer distance.

1.6 Proposed Subdivision and Development

The subdivision of the subject land is expected to occur in two stages as follows:

- Stage 1 (20 years) will only allow subdivision to minimum of 1.5 - 2ha for dry industries as there is no reticulated water supply; and
- Stage 2 will allow for further subdivisions of smaller lots with a minimum size of 0.4ha which are fully serviced.

The subdivision concept plan for Stage 1 is shown in Figure 5. This will potentially provide for up to 127 lots as referenced in Table 2.

The subdivision concept plan recognises the possible realignment of the Kwinana Freight Rail parallel with the southern extension of the Tonkin Highway. The eastern portion of the site between the possible railway line extension and the Tonkin Highway reserve has been left as a 'balance lot' pending further investigations relating to a possible intermodal facility or related transport infrastructure.

The following road widenings are proposed but the timing of these is unknown:

- Kargotich Road - 29.7m on the eastern side;
- Bishop Road - 26.2m on the southern and northern sides; and
- Mundijong Road - 36.7m on the northern side.

Pure Steel Lane will remain open during stage one, as such time as the land owners subdivide and the modified road infrastructure is developed.

There are two main 'spine' roads within the subdivision which will be 30m wide, while the other subdivision roads will be 20m wide.

Table 2 Stage 1 Lot Yield

Component	Area (ha)	Potential Lot Yield
General Industry	260	72
Light Industry	120	35
Service Commercial	30	20
Ecological Corridors	20	N/A
Drainage Corridors	15	N/A
Multiple Use Corridors	25	N/A
Total	470	127

The plan makes provision for a multiple use corridor between Kargotich Road and the overhead 330 kV transmission line. This corridor will be used for future road widening, drainage, landscaping and possible passive recreation. This will be vested in the crown for the purpose of a MUC and potential road widening of Kargotich Road.

The plan provides for two ecological corridors running east / west through the site. The corridors generally reflect the location of existing drainage channels. Subject to further detailed planning, there is the potential for the corridors to be re-habilitated as 'living streams' and passive recreational opportunities, including bridle paths or tracks. The indicative cross sections are shown in Figure 6.

The proposed development setbacks are:

- General Industry – Front Setback of 20m, Side Setback of 10m;
- Light Industrial – Front Setback of 12m, Side Setback of 6m; and
- Service Commercial (Highway Commercial) – Front Setback of 12, Side Setback of 6m.

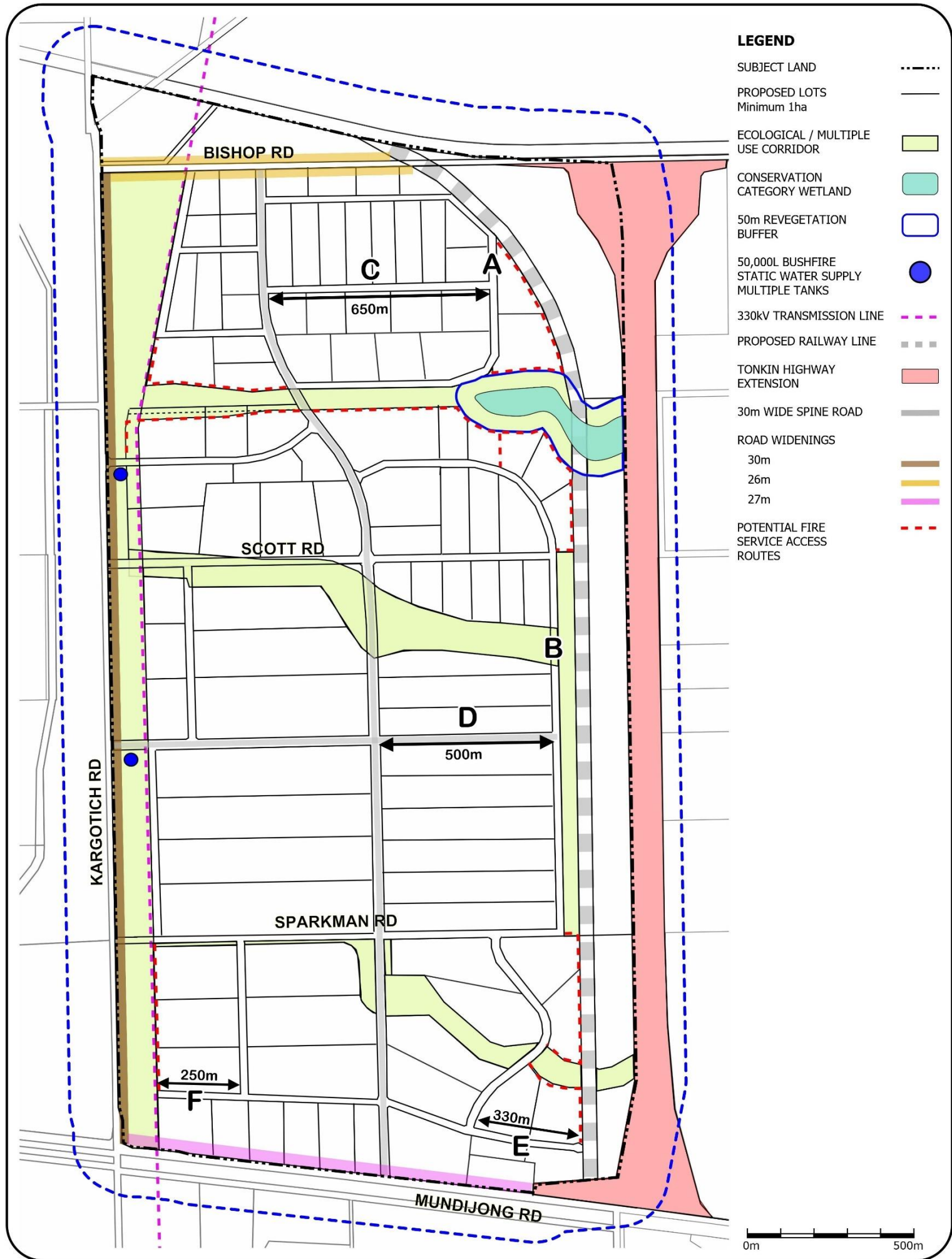


FIGURE 5
SUBDIVISION CONCEPT PLAN



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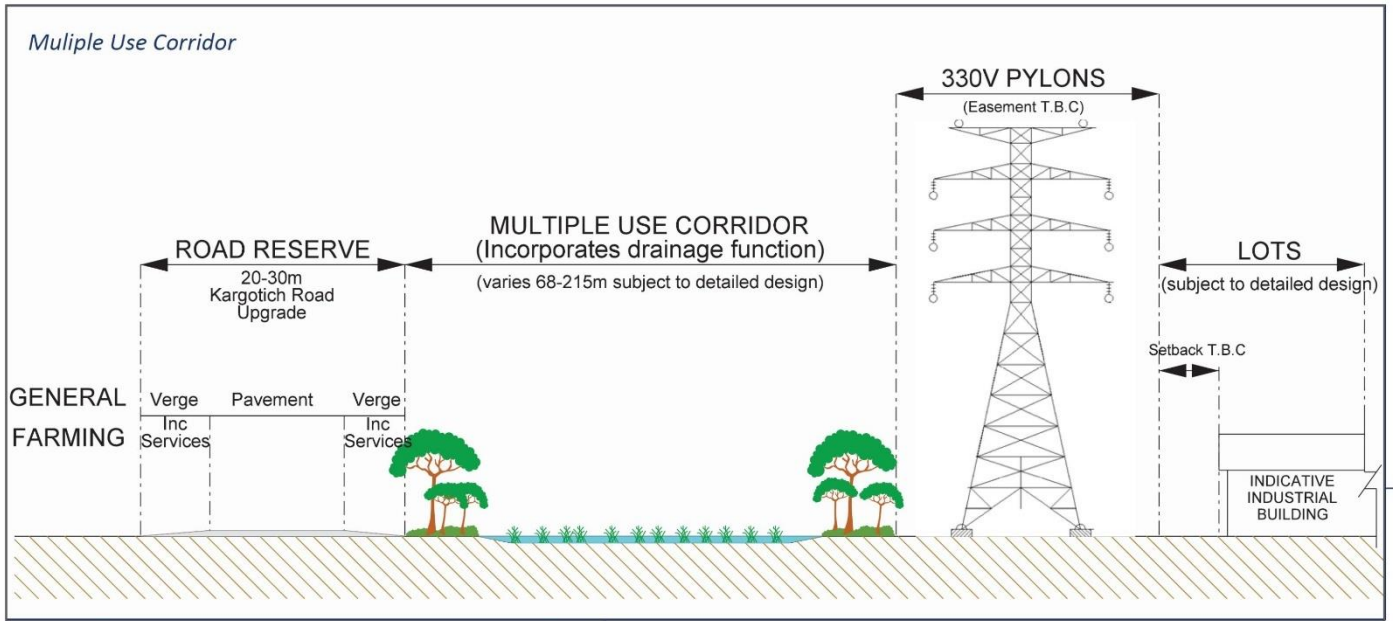


FIGURE 6
INDICATIVE CORRIDOR CROSS SECTIONS



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2.0 Environmental Considerations

2.1 General

State Planning Policy 3.7 (SPP3.7) policy objective 5.4 recognises the need to consider bushfire risk management measures alongside environmental, biodiversity and conservation values.

PGV Environmental (23 November 2012) prepared an environmental assessment to support the structure plan. The results of the desktop assessment conclude that the potential for industrial development to negatively impact on the bio-physical environment are considered to be low.

A large proportion of the site is mapped as a palus plain Multiple Use Wetland. A portion of the Manjedal Brook is also categorised as a Conservation Category Wetland.

The site does not contain any regionally significant vegetation and there is no Declared Rare or Priority Flora or Threatened Ecological Communities (TECs) are likely to be on the site.

The Bush Forever Site No 360 is located the Mundijong Road reserve adjacent to the southern boundary of the site and it contains plant communities representative of the eastern side of the Swan Coastal Plain that are considered to be regionally significant. The portion of the road reserve to the north of Mundijong Road does not exhibit any conservation values and the vegetation would not be classified as these TECs.

The report recommends that:

1. A Wetland Management Plan be prepared for the mapped wetland and adjoining drainage line to be rehabilitated as an ecological corridor in the development. This should be during subdivision in areas adjacent to the brook and outline measures to maintain the hydrology and improve the environmental values of the wetland.
2. A buffer of 30m to the drainage line (top of bank) should be imposed as well as a 50m buffer the outer extent of wetland vegetation, whichever is greater, to the well vegetated eastern part of Manjedal Brook.
3. Wherever possible, trees should be retained in the development particularly in road reserves and carparks. Drainage corridors, open space and road reserves can be enhanced by planting native species.
4. That any upgrading of Mundijong Road should be on the northern of the existing road as the Threatened Ecological Communities are located on the southern side of the road reserve.
5. Consideration will need to be given to retaining Marri trees to protect habitat for the three species of Black Cockatoo.

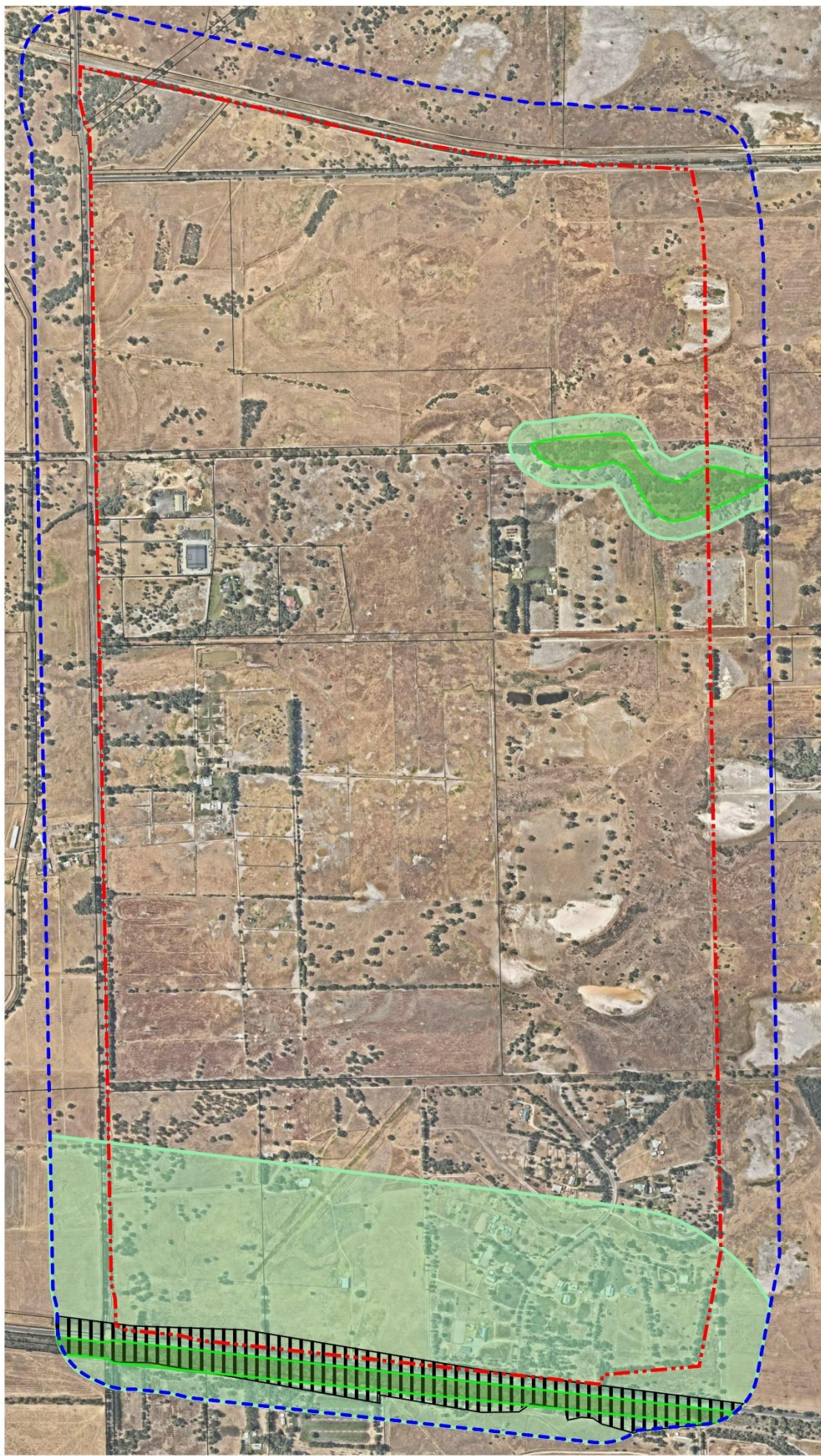
The location of these features is shown in Figure 7.

2.2 Clearing, Revegetation and Landscaping

Stage 1 is based upon the following assumptions:

- That the proposed lots will have any internal vegetation modified to become low threat vegetation in order for development to proceed.
- The existing vegetation in the Multiple Use, Ecological Corridors, Railway line deviation and Tonkin Highway extension will remain.
- That revegetation of the Multiple Use and Ecological Corridors as living streams will occur at the subdivision stage and in the absence of any specifications for this it has been shown as grassland.
- That the 50m buffer to the Conservation Category Wetland will be fully revegetated.
- That the proposed road widenings will be fully cleared.

The expected clearing and revegetation areas for Stage 1 are shown in Figure 8.

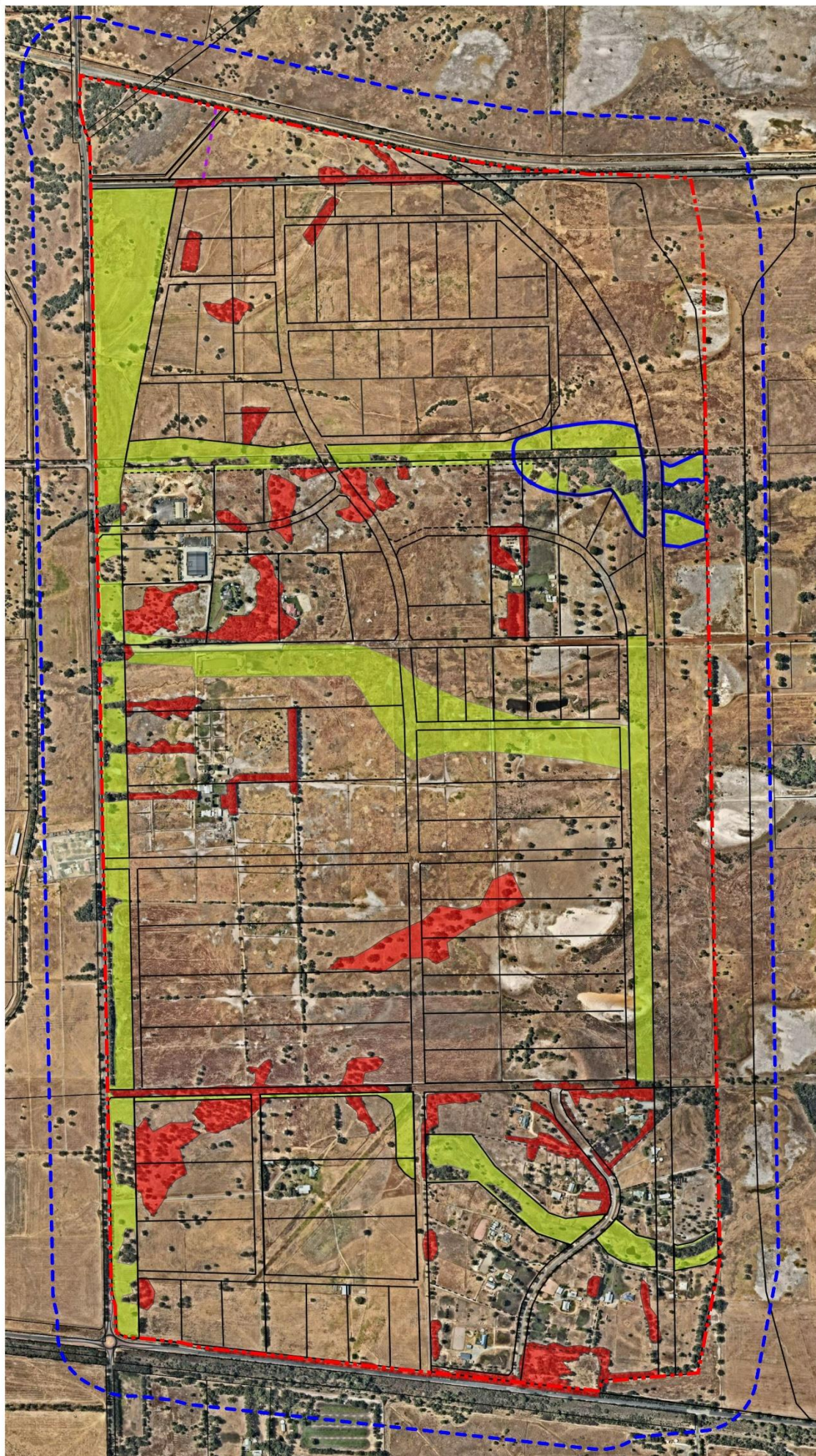


LEGEND

- SUBJECT LAND - - - - -
- 150m BUFFER - - - - -
- CONSERVATION CATEGORY WETLAND ■
- ENVIRONMENTALLY SENSITIVE AREA ■
- BUSH FOREVER SITE 360 ▨



FIGURE 7
ENVIRONMENTAL FEATURES



LEGEND

- SUBJECT LAND —
- 150m BUFFER - - -
- VEGETATION TO BE CLEARED (Grassland not shown) ■
- LANDSCAPING or REVEGETATION ■
- 50m BUFFER TO CONSERVATION CATEGORY WETLAND □

FIGURE 8
CLEARING & REVEGETATION

3.0 Bushfire Assessment Results

3.1 Assessment Inputs - Vegetation Classification

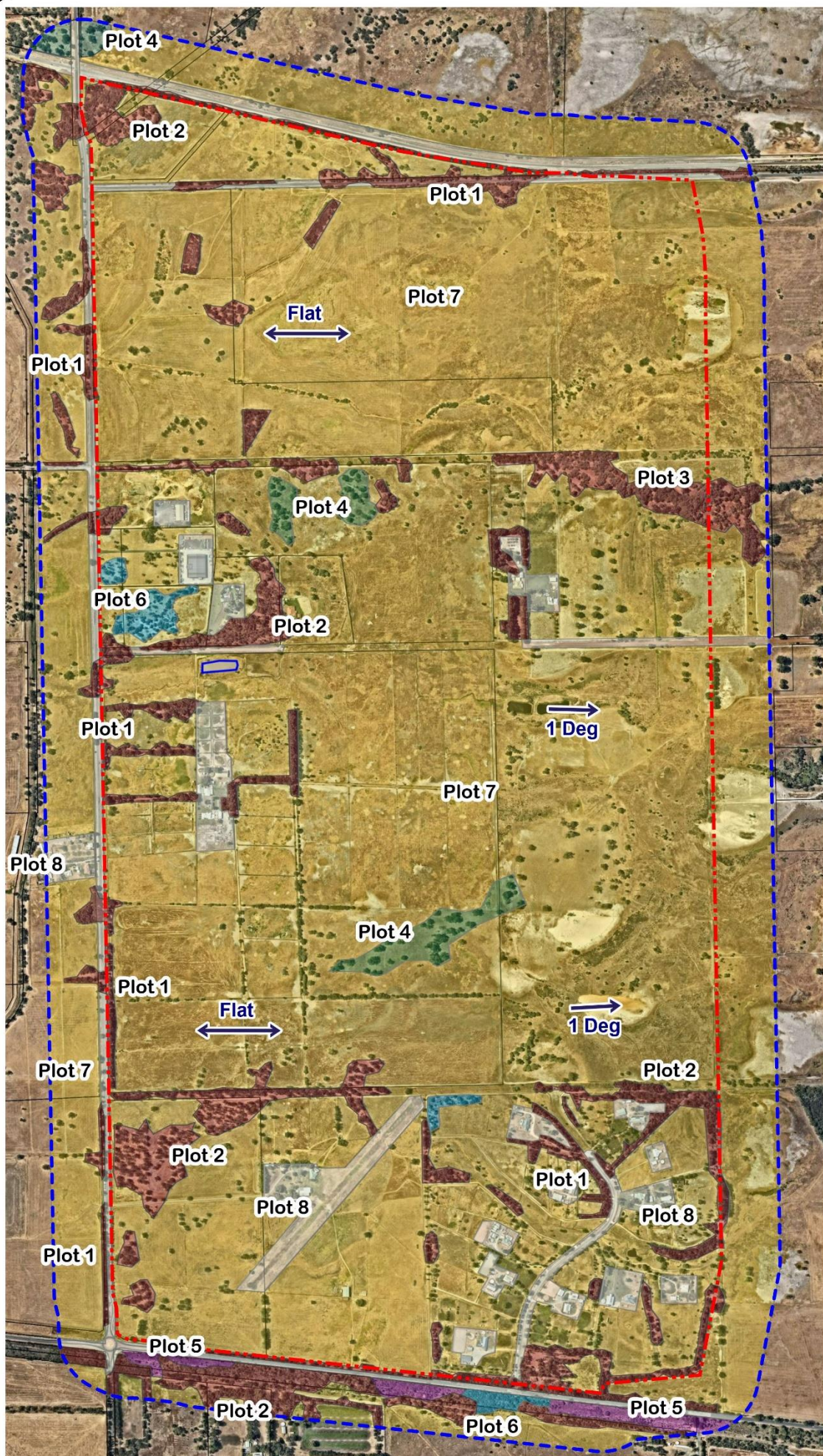
All vegetation within 150m of the site / proposed development was classified in accordance with:

- Clause 2.2.3 of Australian Standard AS3959 Construction of Buildings in Bushfire Prone Areas;
- The Visual Guide for Bushfire Risk Assessment in Western Australia; and
- Applicable Fire Protection Australia BPAD Practice Notes.

Given the size of the subject land and the strategic nature of this assessment, regard has been given to the predominant vegetation classifications, rather than smaller individual areas which may be larger than 2,500sqm or 20m wide. The vegetation plots are shown in Figure 9 and described in Table 3. The vegetation photographs are contained in Appendix 1.

Table 3 Vegetation Summary

Vegetation Plot	Classification	Description
1	Class A Forest	This is primarily linear vegetation along the road verges. Both sides of the road are contiguous as there is often only a 10m separation distance. The total width may be 20m in width but is adjacent to other classified vegetation which is typically grassland. This plot also includes boundary windbreaks which are not a single line of trees and also parts of the drainage lines.
2	Class A Forest	These are more substantial areas of vegetation.
3	Class A Forest	This is the vegetation near Leipold Road associated with Manjedal Brook.
4	Class B Woodland	The woodland areas are groups of paddock trees which are generally Sheoaks with a grassland understorey that is actively being grazed by stock.
5	Class C Shrubland	Low heath associated with the bush forever site along Mundijong Road.
6	Class D Scrub	These area areas of scrub vegetation up- to 6m in height generally associated with the drainage areas and in particular parts of the bush forever site along Mundijong Road.
7	Class G Grassland	This is generally pasture within the subject land and the surrounding rural properties which is being used for grazing.
8	Low threat vegetation	Managed land associated with dwellings and other developments being exempt vegetation pursuant to Clause 2.2.3.2(f).



LEGEND

- SUBJECT LAND - - - - -
- VEGETATION ASSESSMENT AREA (150m from the external boundary of the subject site) - - - - -
- UPSLOPE →
- VEGETATION PLOT —
- VEGETATION CLASS
- A FOREST ■
- B WOODLAND ■
- C SHRUBLAND ■
- D SCRUB ■
- G GRASSLAND ■
- EXCLUDED 2.2.3.2 (f) Managed Land □

FIGURE 9
VEGETATION CLASSIFICATION

3.2 Assessment Outputs

3.2.1 Bushfire Hazard Level Assessment

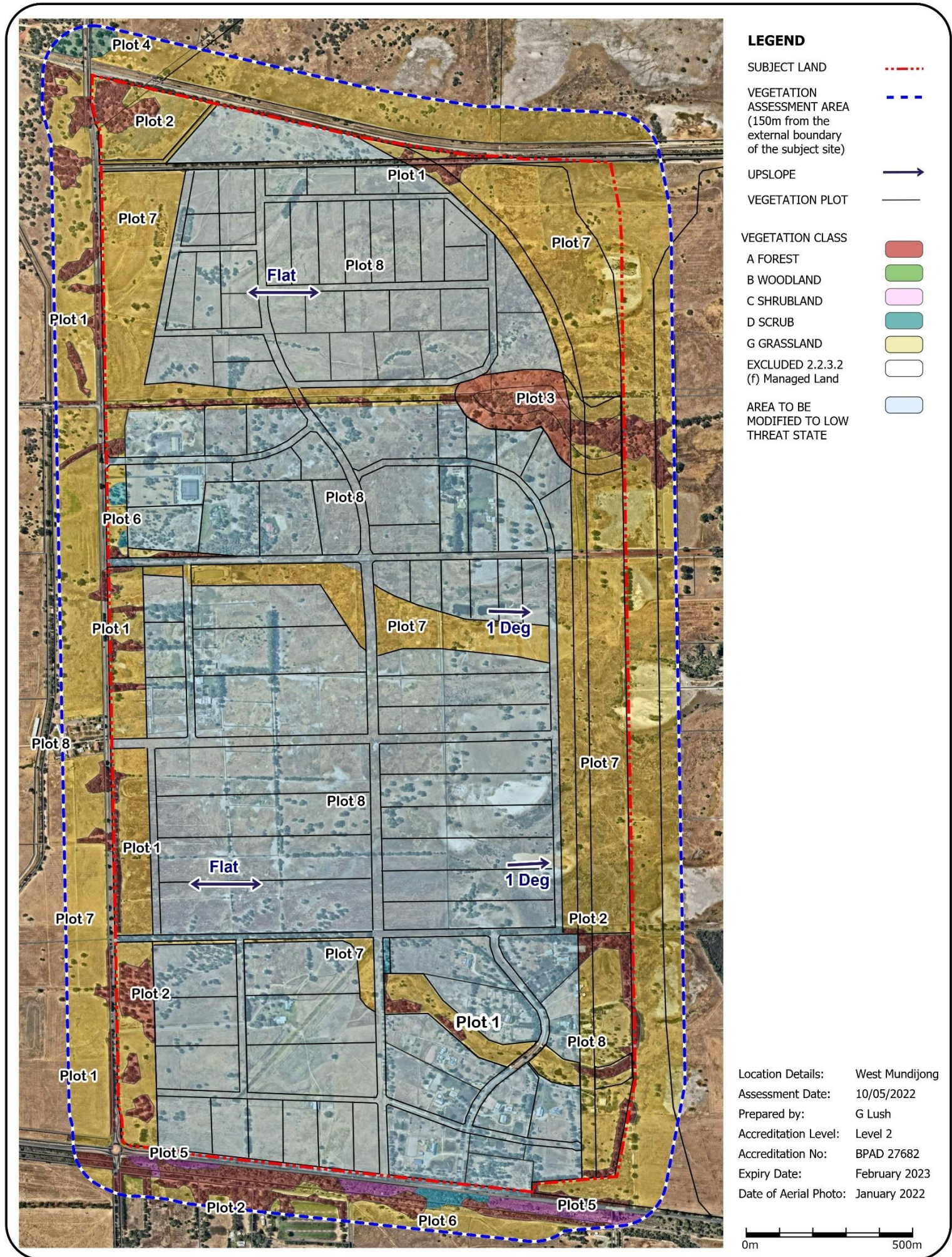
The bushfire hazard primarily relates to the vegetation on the site, the type and extent (area) of vegetation and its characteristics. The methodology for determining the bushfire hazard level is contained in the Guidelines for Planning in Bushfire Prone Areas (Section 4.1 and Appendix 2).

The classifications are as follows:

Extreme Hazard	<ul style="list-style-type: none">• Class A Forest• Class B Woodland (05)• Class D Scrub• Any classified vegetation with a greater than 10 degree slope
Moderate Hazard	<ul style="list-style-type: none">• Class B Open Woodland (06), Low Woodland (07) Low Open Woodland (08) Open Shrubland (09) *• Class C Shrubland• Class E Mallee/Mulga• Class G Grassland including sown pasture and crops• Vegetation that has a low hazard level but is within 100 metres of vegetation of vegetation classified as a moderate or extreme hazard.
Low Hazard	<ul style="list-style-type: none">• Low threat vegetation, may include the following: areas of maintained lawns, gold courses, public recreation reserves and parklands, vineyards, orchards; cultivated gardens, commercial nurseries, nature strips and windbreaks.• Managed grassland in a minimal fuel condition meaning that there is insufficient fuel available to significantly increase the severity of the bushfire attack, for example short cropped grass to a nominal height of 100mm.• Non vegetated areas including waterways; roads; footpaths; buildings or rock outcrops.

The modified vegetation classifications shown in Figure 10 and are based upon the assumptions in Section 2.2 regarding clearing and revegetation. The bushfire hazard assessment levels for the developed land are shown in Figure 11.

Most of the subject land is expected to have a low bushfire hazard level when developed. Depending upon the revisions to the bushfire prone mapping the land which is shown as having a low bushfire hazard level, may not be designated as being bushfire prone. Consequently, subdivision and development of that area would not be subject to State Planning Policy SPP3.7 Planning in Bushfire Prone Areas or the Bushfire Protection Criteria.



LEGEND

- SUBJECT LAND - - -
- VEGETATION ASSESSMENT AREA (150m from the external boundary of the subject site) - - -
- UPSLOPE →
- VEGETATION PLOT
- VEGETATION CLASS
 - A FOREST █
 - B WOODLAND █
 - C SHRUBLAND █
 - D SCRUB █
 - G GRASSLAND █
 - EXCLUDED 2.2.3.2 (f) Managed Land
 - AREA TO BE MODIFIED TO LOW THREAT STATE █

Location Details: West Mundijong
 Assessment Date: 10/05/2022
 Prepared by: G Lush
 Accreditation Level: Level 2
 Accreditation No: BPAD 27682
 Expiry Date: February 2023
 Date of Aerial Photo: January 2022

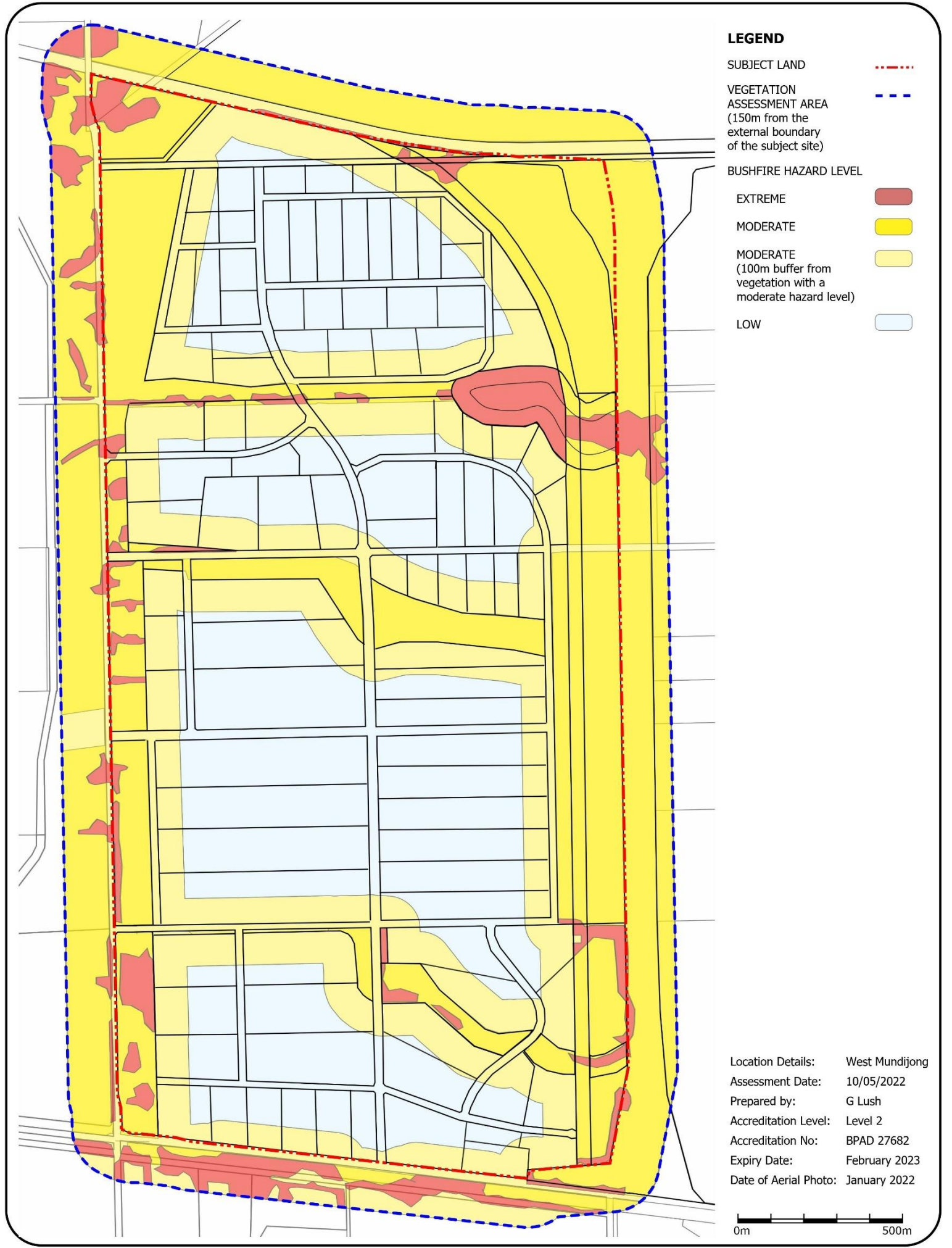
0m 500m

FIGURE 10
 MODIFIED VEGETATION CLASSIFICATION



Job No 22-003
 Rev Description Date
 A Preliminary 08/04/2022





- LEGEND**
- SUBJECT LAND - - - - -
 - VEGETATION ASSESSMENT AREA (150m from the external boundary of the subject site) - - - - -
 - BUSHFIRE HAZARD LEVEL
 - EXTREME ■
 - MODERATE ■
 - MODERATE (100m buffer from vegetation with a moderate hazard level) ■
 - LOW ■

Location Details: West Mundijong
 Assessment Date: 10/05/2022
 Prepared by: G Lush
 Accreditation Level: Level 2
 Accreditation No: BPAD 27682
 Expiry Date: February 2023
 Date of Aerial Photo: January 2022



FIGURE 11
BUSHFIRE HAZARD LEVEL ASSESSMENT
 (For developed land)



Job No 22-003
 Rev Description Date
 A Preliminary 08/04/2022



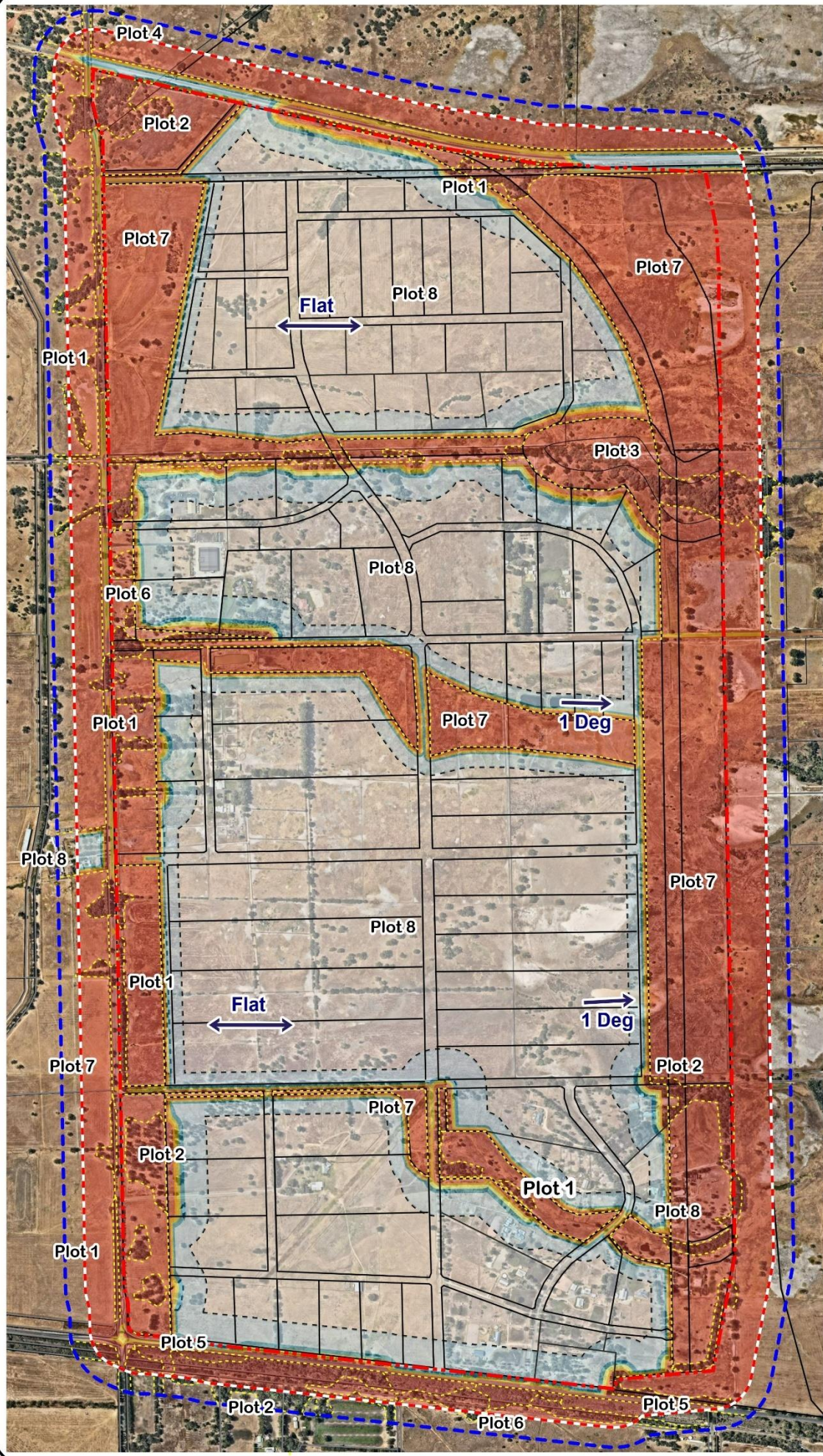
3.2.2 BAL Contour Map

A BAL Contour Map is a plan of the subject lot/s illustrating the potential radiant heat impacts and associated indicative BAL ratings in reference to any classified vegetation remaining within 100 metres of the assessment area after the development is completed. They may be subject to change arising from alterations to site conditions, amendments to AS3959, practice notes, or methodology. Individual BAL Assessments may vary depending upon the characteristics of the vegetation when the BAL Assessment is undertaken.

The BAL Contour Map is shown in Figure 12.

The major portion of all of the proposed lots have either a BAL- 12.5 or a BAL - Low rating. Multiple lots may potentially have a BAL - 40/FZ encroachment of up to 21m as shown below. This will be from bushland along the existing road verges or the multiple use corridors.

This issue is discussed further in Section 4.3.



LEGEND

- SUBJECT LAND —
- VEGETATION ASSESSMENT AREA (150m from the external boundary of the subject site) - - -
- BAL CONTOUR ASSESSMENT AREA (100m from the external boundary of the subject site) - - -
- PROPOSED CADASTRE —
- UPSLOPE →
- VEGETATION PLOT ▬▬▬
- INDICATIVE BAL/ RATING
- BAL-FZ ▭
- BAL-40 ▭
- BAL-29 ▭
- BAL-19 ▭
- BAL-12.5 ▭
- BAL-Low ▭

The BAL Contours shown on this plan are indicative and reflect the anticipated ratings for the completed development, based upon the assumptions referenced in the report. They should not be used for BAL Assessments and maybe subject to change arising from alterations to site conditions, AS3959, practice notes, or methodology.

Location Details: West Mundijong
 Assessment Date: 10/05/2022
 Prepared by: G Lush
 Accreditation Level: Level 2
 Accreditation No: BPAD 27682
 Expiry Date: February 2023
 Date of Aerial Photo: January 2022

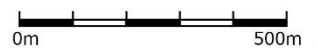


FIGURE 12
BAL CONTOUR MAP



Job No 22-003
 Rev Description Date
 A Preliminary 08/04/2022



4.0 Identification of Bushfire Hazard Issues

4.1 District Context

The relationship of the subject land to the surrounding district is shown in Figure 1. The proposed development is introducing substantial values (property and people) which must be protected from the risk posed by the potential bushfire hazard. Bushfires occur regularly within the locality and pose a threat to life and property.

A bushfire can have a number of ignition sources which can originate from either natural or human causes such as:

- Lighting strikes;
- Unattended camp fire;
- Discarded match or cigarette;
- Dry grass in contact with vehicle exhausts;
- Sparks from grinders, slashing or other mechanical operations;
- Backyard rubbish burning;
- Hazard reduction burns;
- Powerlines sparking in strong winds or falling;
- Pole top fires; and
- Deliberate arson.

The surrounding land is a mixture of urban, rural residential, and rural land uses. The rural land uses are typically large properties used for broad acre grazing. The surrounding land is predominantly grassland with dispersed bushland which is both in blocks and also linear bushland along road reserves.

The most significant area of bushland within the locality is situated approximately 2.5kms south west of the site and this is approximately 900 hectares.

The surrounding land is a mixture of industrial, commercial, residential, rural residential, and rural land uses. This has a moderate to extreme bushfire hazard level with Melaleuca scrub vegetation being the most prominent vegetation class.

The primary bushfire hazard is from a fast moving grass fire which can still have the potential to be a destructive fire threatening life and property. The likelihood of this occurring increases when there is a high chance of ignition due to the amount of fuel, the extent of vegetation curing (drying out) the temperature; relative humidity and wind speed.

The main bushfire threat would be a fire from the south or south west which has the potential to be large scale "landscape" fire which extends for over a kilometre and is likely to occur over lengthy period which could be several days.

There is excellent district access to the subject land from multiple directions on district distributor roads.

4.2 High Risk Land Uses

High risk land uses are those uses which may lead to the potential ignition, prolonged duration and/or increased intensity of a bushfire. Such uses may also expose the community, fire fighters and the surrounding environment to dangerous, uncontrolled substances during a bushfire event. Examples of high risk land uses include service stations, landfill sites, bulk storage of hazardous materials, fuel depots.

Depending upon the specific land use provisions, it may be possible that high risk land uses are permissible within the service commercial area.

SPP 3.7 requires that a development application for any high risk land use is to be accompanied by a Bushfire Management Plan jointly endorsed by the local government and the Department of Fire and

West Mundijong Industrial Structure Plan

Emergency Services. This may include a risk management plan that addresses bushfire risk management measures for any flammable on-site hazards.

These provisions only apply when the development site is designated as being bushfire prone and has a rating of between BAL-12.5 and BAL-29.

4.3 BAL Setbacks

SPP3.7 Planning in Bushfire Prone Areas has a presumption against development of land with a BAL-FZ or BAL-40 rating. The BAL setbacks commence from the edge of the classified hazard vegetation. A cleared site will still have a BAL-FZ/40 rating extending into to it from vegetation on an adjoining property or road reserve.

The minimum BAL setbacks for vegetation on flat land are shown in Table 4 with the BAL-29 setback highlighted. This is also illustrated for Forest vegetation in Figure 13.

Version 1.4 of the Guidelines (Dec 2021) now clarifies that a "development site" is defined as that part of a lot on which a building that is the subject of development stands or is to be constructed (page 52). As the lots will be a minimum size of 1 hectare, there should be ample room to locate the building outside of any land with a BAL - 40/FZ rating.

Table 4 BAL Setbacks

Vegetation Classification	Bushfire Attack Levels (BALs) - Flat Land				
	BAL - FZ	BAL - 40	BAL - 29	BAL - 19	BAL - 12.5
	Distance (m) of the site from the vegetation class				
A Forest	< 16	16	21	31	42
B Woodland	< 10	10	14	20	29
C Shrubland	< 7	7	9	13	19
D Scrub	< 10	10	13	19	27
E Mallee/Mulga	< 6	6	8	12	17
F Rainforest	< 6	6	9	13	19
G Grassland	< 6	6	8	12	17

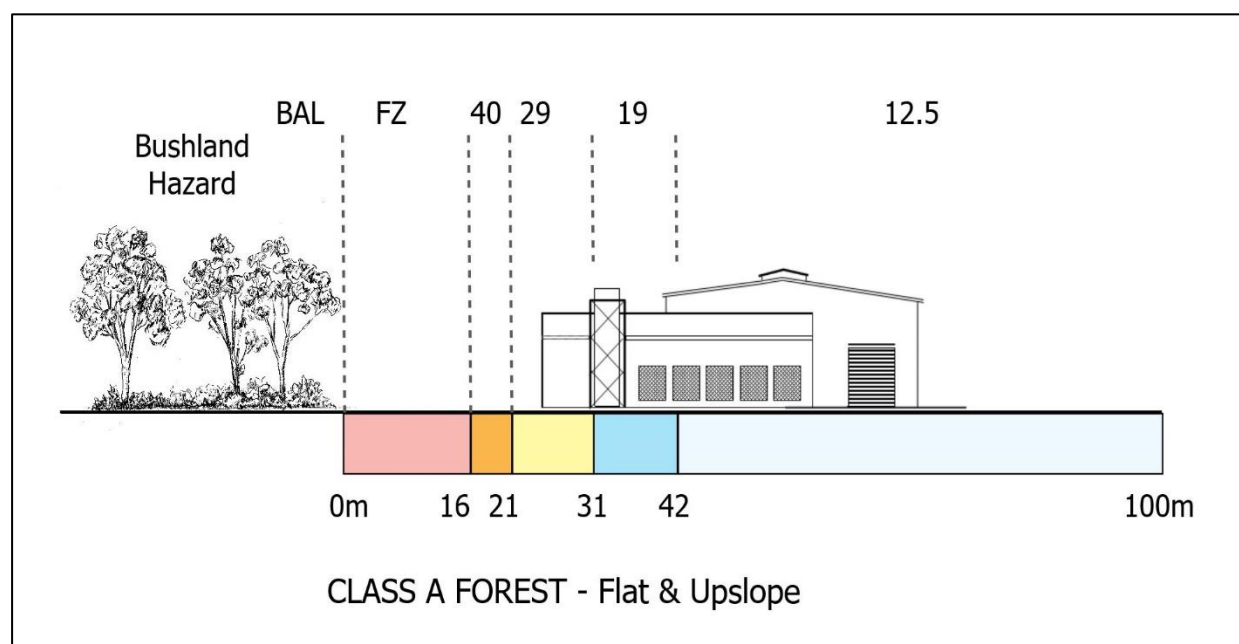


Figure 13 BAL X Section

West Mundijong Industrial Structure Plan

Restricting building development within any part of a subdivided lot with a BAL - 40/FZ rating is routinely done by the Western Australian Planning Commission using Model Subdivision Condition F3. This provides for the preparation of a definition plan and restrictive covenant so as to exclude development from that portion of a lot with a BAL-FZ/40 rating. It states that:

A plan is to be provided to identify areas of the proposed lot(s) that have been assessed as BAL-40 or BAL-Flame Zone. A restrictive covenant to the benefit of the local government, pursuant to section 129BA of the Transfer of Land Act 1893, is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a restriction on the use of the land within areas that have been assessed as BAL-40 or BAL-Flame Zone. Notice of this restriction is to be included on the diagram or plan of survey (deposited plan). The restrictive covenant is to state as follows:

"No habitable buildings are to be built within areas identified as BAL-40 or BAL-Flame Zone". (Local Government)

4.4 Local Access

When the site when fully developed will have limited internal access to the east due to the railway line deviation and Tonkin Highway extension. Main Roads WA traditionally will not support any local access to the highway because:

- It is a declared access road; and
- Emergency fire access to a highway (which is dangerous if uncontrolled) can become somewhat normalised, hard to manage (without local ranger monitoring and infringement etc)

The internal subdivision roads provide "loop" connections back to the main north - south spine road (See Figure 5). However, the subject land extends for approximately 500m east of the spine road, which may create access issues from a fire coming from a westerly direction. It is also noted that the major portion of the development will have either a low Bushfire Hazard Level or a BAL - Low rating.

4.5 Construction Standards

Through its adoption of the National Construction Code the Building Act and Regulations contain the minimum set of technical provisions for the design and construction of buildings and other structures in Western Australia. It specifically requires that new residential buildings, extensions and alterations to existing buildings in designated bush fire prone areas are to be constructed in accordance Australian Standard AS3959 (2018) Construction of Buildings in Bushfire Prone Areas.

Where AS3959 is applied through the National Construction Code it does not automatically apply to commercial or industrial buildings. In this situation the implementation of any construction measures, if required, must be provided for by other instruments such as a condition of development/planning approval.

4.6 Summary

The key management issues that are likely to require consideration as part of future development within the site include:

1. Provision of appropriate separation distance from permanent bushfire hazards surrounding the site to ensure a BAL rating of BAL-29 or less can be achieved for the individual development sites;
2. Provision of appropriate vehicular access to ensure that when development within the site is fully constructed, egress to at least two different destinations will be available to future workers and emergency personnel;
3. Provision of appropriate water supply and associated infrastructure; and
4. Staging of any subdivision to ensure that there is appropriate access and management of any hazard areas.

5.0 Assessment Against the Bushfire Protection Criteria

5.1 BPC Elements

The requirements of the Bushfire Protection Criteria as contained in Version 1.4 (Dec 2021) of the Guidelines for Planning in Bushfire Prone Areas are referenced in the following sections.

5.1.1 Element 1 Location

Acceptable Solution	Compliance
<p><u>A1.1 Development location</u></p> <p>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.</p>	<p>The majority of the land (95%) is expected to have a moderate or low hazard level when developed. The proposed lots are large enough to ensure that development sites can easily located achieve a BAL-29 rating or lower.</p>

5.1.2 Element 2 Siting and Design of Development

Acceptable Solution	Compliance
<p><u>A2.1 Asset Protection Zone</u></p> <p>Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:</p> <ul style="list-style-type: none"> • 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. • Management: the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones'. 	<p>The proposed lots are large enough to provide an asset protection zone around any proposed development within the proposed lot boundaries.</p>

5.1.3 Element 3 Vehicular Access

Acceptable Solution	Compliance
<p><u>A3.1 Public road</u></p> <p>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.</p> <p>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.</p> <p><u>A3.2a Multiple access routes</u></p> <p>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).</p> <p>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.</p> <p>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:</p> <ul style="list-style-type: none"> • 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. <p><u>A3.2b Emergency access way</u></p> <p>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.</p> <p>An emergency access way is to meet all the following requirements:</p> <ul style="list-style-type: none"> • 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. 	<p>The proposed subdivision roads are to be designed in accordance with Institute of Public Works Engineering Australia WA Division Inc. (2009) Local Government Subdivisional Guidelines.</p> <p>As referenced in Section 1.6 the internal subdivision roads will be either 20 or 30m wide and will comply with the technical design including having a 6m horizontal clearance to vegetation.</p> <p>External access is provided in multiple directions by Mundijong, Kargotich and Bishop Roads.</p> <p>Internally, the north - south spine road (See Figure 5) provides a connection between Mundijong and Bishop Roads. There are then multiple westerly connections to Kargotich Road.</p> <p>East of the north - south spine road, the subdivision roads are "loop" roads with no external connection east of the site due to the extension of Tonkin Highway (roads A and B on Figure 5).</p> <p>These are considered to be no through roads and these extend for over 500m (roads C and D). The balance of the of the no through roads greater than 200m do traverse areas which will have a partial BAL - 12.5 and BAL - Low rating back to the spine road.</p> <p>No emergency access ways are proposed for the overall development.</p>

Acceptable Solution	Compliance
<p><u>A3.3 Through-roads</u></p> <p>All public roads should be through-roads. No-through roads should be avoided and should only be considered as an acceptable solution where:</p> <ul style="list-style-type: none"> • 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 exemption provisions in A3.2a of this table. <p>A no-through road is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements of a public road (Table 6, Column 1); and • turn-around area as shown in Figure 24 (18 metre diameter head). <p><u>A3.4a Perimeter roads</u></p> <p>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:</p> <ul style="list-style-type: none"> • 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. <p>A perimeter road is to meet the requirements contained in Table 6, Column 1.</p> <p>A perimeter road may not be required where:</p> <ul style="list-style-type: none"> • 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 <p><u>A3.4b Fire service access route</u></p> <p>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.</p> <p>A fire service access route is to meet all the following requirements:</p> <ul style="list-style-type: none"> • requirements in Table 6, Column 3; • be through-routes with no dead-ends; 	<p>There are two no through roads as shown on Figure 5.</p> <ul style="list-style-type: none"> • Road E is 330m in length; and • Road F is 250m in length. <p>In both instances these roads only provide access to two or three lots. The boundaries of these commence 150m from the intersection for Road E and 100m for Road F.</p> <p>The balance portion/length of the road reserve may not be formally constructed as it only provides access to the multiple use corridors. Alternatively, it might be constructed as a fire service access route.</p> <p>The primary vegetation hazard within the subdivision will be the multiple use, ecological corridors. This includes the revegetated buffer to the Manjedal conservation wetland.</p> <p>In a number of locations, the proposed lots will have either a rear or side boundary adjacent to the corridors. In many instances the adjacent vegetation will be grassland or low threat vegetation when the corridors are developed.</p> <p>To provide suitable access for fire fighting appliances, fire service access routes can be provided between the development sites and the hazard vegetation or other features such as the railway line deviation.</p> <p>A number of potential FSARs are shown on Figure 5. The specific location of these will be determined at the subdivision stage noting that they may be located either on freehold land or within the Multiple Use, Ecological Corridors where they are also used for service access.</p>

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Acceptable Solution	Compliance
bay and constructed private driveway to be a minimum six metres); and	
<ul style="list-style-type: none"> • 18m diameter turn-around area as shown in Figure 28 and within 30 metres of the habitable building. 	

5.1.4 Element 4 Water

Acceptable Solution	Compliance
<p><u>A4.1 Identification of future water supply</u> 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.</p> <p>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.</p> <p><u>A4.2 Provision of water for firefighting purposes</u> 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.</p> <p>Where these specifications cannot be met, then the following applies:</p> <ul style="list-style-type: none"> • The provision of a water tank(s), in accordance with the requirements of Schedule 2 being 50,000L per 25 lots or part thereof or 10,000L tank per lot • Where the provision of a strategic water tank(s) is applicable, then the following requirements apply: <ul style="list-style-type: none"> – 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). <p>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.</p>	<p>Stage 1 of the development will be for dry industries as there is no reticulated water supply servicing the site. Strategic water supply for fire fighting will be from dedicated water tanks located within the Multiple Use Corridor as shown in Figure 5.</p> <p>On the basis of there being 125 proposed lots, it will be necessary to provide five (5) 50,000L water tanks for bushfire fighting purposes.</p> <p>It is noted that this supply is separate to:</p> <ul style="list-style-type: none"> • A development having an additional water supply for bushfire fighting located within the lot; and/or • Water supply requirements for structural fire fighting in accordance with the Abuilding Code of Australia including internal hydrants. <p>While it is possible to combine the tank capacity, it is recommended that provision should be made to allow for multiple fire appliances to fill up simultaneously.</p> <p>Not applicable</p>

6.0 Responsibilities for Implementation and Management of the Bushfire Measures

The management of the risk posed by bushfires is a shared responsibility between landowners, government and industry. These responsibilities are documented in Table 5.

The management measures listed below should not be construed to assure total bushfire protection and do not guarantee that a building will not be damaged in a bushfire. The severity of a bushfire will depend upon the vegetation fuel loadings; the prevailing weather conditions and the implementation of appropriate fire management measures.

Table 5 Implementation

No	MANAGEMENT ACTION	AGENCY
1.0 Subdivision Applications		
1.1	Reviewing this overall Bushfire Management Plan to reflect the confirmed subdivision design and any modifications to Bushfire Guidelines and Bushfire Protection Criteria.	Council
1.2	Compliance with the applicable measures in this Bushfire Management Plan relating to the subdivision construction including those outlined in Section 5.0 and any vegetation modifications required to achieve the proposed BAL ratings.	Council Developer
1.3	Preparation of a Bushfire Management Plan for individual subdivisions demonstrating: <ul style="list-style-type: none"> • Compliance with the Bushfire Protection Criteria; • Temporary road connections to provide multiple access; and • Any works required on adjacent land to implement assigned BAL ratings. 	Developer
1.4	Approval of landscape designs for public open space areas, multiple use, ecological corridors and drainage features including wetland buffer.	Council
1.5	Provision of five 50,000L water tanks within the Multiple Use Corridor with appropriate vehicle access	Council
1.6	Confirming the location of any proposed fire service access route and in particular where these might be located on freehold land.	Council
1.7	Constructing any proposed fire service access route located on private land in accordance with the stipulated requirements, including the provision of gates and signage. The fire service access route is to be provided as an easement.	Developer
1.5	Providing certification when applying for a subdivision clearance that the BAL ratings assigned in the Local Development Plan and/or Bushfire Management Plan are still applicable and any associated clearing and/or revegetation works have been done.	Developer
1.6	Requesting a subdivision condition to require a restrictive covenant to the benefit of the local government, pursuant to section 129BA of the Transfer of Land Act 1893, on the certificate(s) of title of any proposed lot(s) where a BAL-FZ/40 rating encroaches onto the lot advising of the existence of a restriction on the use of the land within areas that have been assessed as BAL- 40 or BAL-Flame Zone.	Council
1.7	Construction of subdivision roads to standards outlined in the BMP to ensure safe access and egress.	Developer
1.8	Providing prospective purchasers with a summary of any BMP	Developer
1.8		Developer

West Mundijong Industrial Structure Plan

No	MANAGEMENT ACTION	AGENCY
2.0 Development of Lots		
2.1	Ensuring that any development application on designated bushfire prone land includes an individual BAL assessment to confirm that the proposed building development site has a maximum BAL-29 rating.	Landowner
2.2	<p>Maintaining the land within the BAL setback as an Asset Protection Zone in accordance with Schedule 1 Element 2 of the Guidelines as follows:</p> <ol style="list-style-type: none"> 1) Fences 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). 2) Fine fuel loads (combustible, dead vegetation matter <6 millimetres in thickness) should be managed and removed on a regular basis to maintain a low threat state at less than 2 tonnes per hectare (on average). Mulches should be non-combustible such as stone, gravel or crushed mineral earth or wood mulch >6 millimetres in thickness. 3) Trees (>6 m in height) should: <ul style="list-style-type: none"> ➤ Be a minimum distance of six metres from all elevations of the building and branches at maturity should not touch or overhang a building or powerline. ➤ Have lower branches and loose bark removed to a height of two metres above the ground and/or surface vegetation. ➤ Have a canopy cover pf less than 15 per cent of the total APZ area. ➤ Have canopies at maturity being 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. 4) Shrub and scrub (0.5 m to 6m in height) should not be: <ul style="list-style-type: none"> ➤ Located under trees or within three metres of buildings. ➤ 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. 5) Ground covers (<0.5 m in height) can be: <ul style="list-style-type: none"> ➤ Planted under trees but must be maintained to remove dead plant material, as prescribed in 'Fine fuel load' above. ➤ Located within two metres of a structure, but three metres from windows or doors if >100 millimetres in height. 6) 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. 7) A defendable space should be provided 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. 8) LP Gas Cylinders should: <ul style="list-style-type: none"> ➤ 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. ➤ Have the pressure relief valve pointing away from the house. ➤ Not have flammable material within six metres from the front of the valve. 	Landowner

West Mundijong Industrial Structure Plan

No	MANAGEMENT ACTION	AGENCY
	<ul style="list-style-type: none"> ➤ Sit on a firm, level and non-combustible base and be secured to a solid structure. 	
2.3	Where a driveway is more than 70m in length it shall be designed and constructed as follows: <ul style="list-style-type: none"> a) Minimum 4m trafficable surface; b) Minimum 6m horizontal clearance to any vegetation; c) Minimum 4.5m vertical clearance to vegetation; d) Maximum grade <50m of 1:10; e) Minimum weight capacity 15 tons; f) Minimum cross fall 1:33; g) Have a 17.5m diameter turning circle in proximity to the dwelling; and h) Any access gates shall be a minimum width of 3.6m. 	Landowner
2.4	Provision of boundary firebreaks in accordance with the Shire's Fire Hazard Reduction Notice.	Landowner
2.5	Undertaking regular maintenance of their property in preparation for the annual fire season.	
2.6	Ensuring that all fire mitigation measures shall be completed by the date prescribed in Shire's Fire Hazard Reduction Notice.	
3.0 Local Government Management		
3.1	Requiring a Bushfire Management Plan for any proposed High Risk land use.	
3.2	Ensuring that any development application complies with the provisions of any approved Bushfire Management Plan	
3.3	Maintaining public reserves under its management in accordance with the prescribed standard.	
3.4	Ensure compliance with its Shire's Fire Hazard Reduction Notice.	



Photograph Locations

Photo 1 **Plot 1**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Linear vegetation along Kargotich Road but not always on both sides of the road. Eucalypts and Sheoaks to 18m, with more than 30% foliage coverage and shrub or grassland understorey.



Photo 2 **Plot 1**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Windbreak and Marri to 20m with more than 40% canopy coverage.



Photo 3 **Plot 1**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Linear vegetation along Kargotich Road but not always on both sides of the road. Eucalypts and Sheoaks to 18m, with more than 30% foliage coverage and shrub or grassland understorey.



Photo 4 **Plot 1**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Introduced Eucalyptus planting along property boundary Pure Steel Lane to 25m height over scrub and juvenile plants.



Photo 5 **Plot 1**

Vegetation Classification

Class A Forest - Low open forest A-04

Description

Roadside vegetation along Bishop Road, predominantly Melaleuca to 10m with some areas of Eucalypts.



Photo 6 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Marri, Flooded Gums to 25m with more than 40% canopy coverage. Grassland understorey but has low branches and fallen dead material.



Photo 7

Plot 2

Vegetation Classification

Class A Forest - Open forest A-03

Description

Melaleuca, with Marri, Flooded Gums to 20m with more than 40% canopy coverage.



Photo 8

Plot 2

Vegetation Classification

Class A Forest - Open forest A-03

Description

Marri, Flooded Gums to 25m with more than 40% canopy coverage. Grassland understorey but has low branches and fallen dead material.



Photo 9

Plot 2

Vegetation Classification

Class A Forest - Open forest A-03

Description

Sheoaks to 20m over paddock grassland but with more than 40% canopy coverage. Grassland understorey but has low branches and fallen dead material.



Photo 10 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Sheoaks to 20m over paddock grassland but with more than 40% canopy coverage. Grassland understorey but has low branches and fallen dead material.



Photo 11 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Dense Sheoaks to 20m over shrubland with more than 60% canopy coverage.



Photo 12 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Mixed Eucalyptus forest south of Mundijong Road to 25m with some scrub and shrub understorey, more than 40% canopy coverage.



Photo 13 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Mixed forest predominantly Sheoaks north of Mundijong Road to 25m with some scrub and shrub understorey, more than 40% canopy coverage.



Photo 14 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Mixed Eucalyptus forest to 25m with some with some Acacia scrub and shrub understorey, more than 40% canopy coverage.



Photo 15 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Marri forest to 25m along Sparkman Road reserve with some with shrub understorey, more than 40% canopy coverage.



Photo 16 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Marri forest to 25m along Sparkman Road reserve with some with shrub understorey, more than 40% canopy coverage.



Photo 17 **Plot 2**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Mixed forest to 25m in R43612 with dense shrub understorey, more than 40% canopy coverage and very heavy near surface fuel loads



Photo 18 **Plot 3**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Marri, Flooded Gum forest Eucalypts along Leipold Road reserve west of the Manjedal Brook wetland. Up to 25m, with more than 30% foliage coverage and shrub or grassland understorey.



Photo 19

Plot 3

Vegetation Classification

Class A Forest - Open forest A-03

Description

Marri, Flooded Gum forest
Eucalypts along Leipold Road
reserve west of the Manjedal Brook
wetland. Up to 25m, with more
than 30% foliage coverage and
shrub or grassland understorey.



Photo 20

Plot 3

Vegetation Classification

Class A Forest - Open forest A-03

Description

Swamp Paperbarks along Leipold
Road associated with the Manjedal
Brook wetland. Up to 20m, with
more than 30% foliage coverage
and shrub or grassland
understorey.



Photo 21

Plot 3

Vegetation Classification

Class A Forest - Open forest A-03

Description

Swamp Paperbarks along Leipold
Road associated with the Manjedal
Brook wetland. Up to 20m, with
more than 30% foliage coverage
and shrub or grassland
understorey.



Photo 22 **Plot 3**

Vegetation Classification

Class A Forest - Open forest A-03

Description

Swamp Paperbarks associated with the Manjedal Brook wetland. Up to 20m, with more than 30% foliage coverage and shrub or grassland understorey.



Photo 23 **Plot 4**

Vegetation Classification

Class B Woodland - Woodland B-05

Description

Paddock trees, Gums and Melaleucas, Sheoaks over grassland with less than 30% canopy coverage.



Photo 24 **Plot 4**

Vegetation Classification

Class B Woodland - Woodland B-05

Description

Paddock trees, Gums and Melaleucas, Sheoaks over grassland with less than 30% canopy coverage.



Photo 25

Plot 5

Vegetation Classification

Class C Shrubland - Closed heath C-10

Description

Heath to 1.2m on the southern side of Mundijong Road being part of the bush forever site.



Photo 26

Plot 5

Vegetation Classification

Class C Shrubland - Closed heath C-10

Description

Heath to 1.2m on the southern side of Mundijong Road being part of the bush forever site.



Photo 27

Plot 6

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Melaleuca spearwood scrub to 6m with more than 40% canopy coverage and continuous vertical fuel structure.



Photo 28 **Plot 6**

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Mixed scrub on the southern side of Mundijong Road to 6m with more than 40% canopy coverage and continuous vertical fuel structure.



Photo 29 **Plot 6**

Vegetation Classification

Class D Scrub - Closed scrub D-13

Description

Mixed scrub on the southern side of Mundijong Road to 6m with more than 40% canopy coverage and continuous vertical fuel structure.



Photo 30 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture G-26

Description

Broad acre pasture, grazing within subject land and surrounding properties.



Photo 31 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 32 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 33 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 34 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 35 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 36 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 37 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 38 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 39 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 40 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 41 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.



Photo 42 **Plot 7**

Vegetation Classification

Class G Grassland – Sown pasture
G-26

Description

Broad acre pasture, grazing within
subject land and surrounding
properties.

