

A photograph of a rural landscape at sunset or sunrise. The foreground is filled with dry, yellowish-brown grass and some green shrubs. In the background, there are rolling hills and a few scattered trees under a sky with soft orange and pink hues.

DRAFT

Shire of Ashburton

Local Planning Strategy

Bushfire Hazard Level Assessment

August 2017

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Executive summary

The Shire of Ashburton is preparing a local planning strategy to guide future land use and development across the Shire, in particular the townsites of Onslow, Tom Price and Paraburdoo. Areas within and around these townsites are within a designated bushfire prone area.

Bushfire risk is a key planning issue in Western Australia. State Planning Policy No. 3.7 Planning in Bushfire Prone Areas and the Guidelines for Planning in Bushfire Prone Areas sets out the framework to manage bushfire risk within planning processes and decisions. Local planning strategies integrate consideration of bushfire risk through a bushfire hazard level assessment.

A bushfire hazard level assessment was undertaken for all investigation and infill areas identified in the draft Shire of Ashburton Local Planning Strategy to consider how bushfire risk may influence future development. The assessment was undertaken in accordance with the methodology prescribed in the technical appendices to the Guidelines for Planning in Bushfire Prone Areas.

Potential townsite expansion areas in Tom Price, Paraburdoo and Onslow are influenced, for the most part, by a moderate bushfire hazard level. Whilst pockets of extreme hazard level were modelled and mapped within Tom Price, the small size and spatial extent of these areas makes it unlikely that they would present an extreme hazard in reality.

The assessment considers that future planning and development of investigation and infill areas can, subject to design, successfully address the identified bushfire hazard, demonstrated by anticipated compliance with bushfire protection criteria set out in technical appendices to the Guidelines for Planning in Bushfire Prone Areas. The nature of development and associated clearing of vegetation will reduce the hazard level for the majority of development areas, and with appropriate planning for access, services, and layout, future development will be able to achieve at least the minimum standards for bushfire exposure in line with state policy.

The role of a local planning strategy is to provide an effective local planning framework to address key issues in local planning processes and decisions. The state policy framework regarding bushfire risk is very well developed, and applies clearly to local planning applications and decisions. Therefore, the Shire of Ashburton Local Planning Strategy does not require additional policy responses to address bushfire risk, as it is adequately dealt with at the state level. Minor modifications to the draft bushfire actions in the draft local planning strategy are recommended to reflect the bushfire hazard level assessment and refine strategic responses.

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.3 and the assumptions and qualifications contained throughout the report.

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- Appendix A – Draft Strategy Plans
- Appendix B – Field observations
- Appendix C – Bushfire protection criteria

1. Proposal details

1.1 Introduction

The draft Shire of Ashburton Local Planning Strategy articulates the Shire's goals for land use and development and the justification and context for future review of the local planning scheme. The local planning strategy provides strategic land use plans for the townsites of Onslow, Tom Price and Paraburdoo, outlining spatial strategies and investigation areas for future urban expansion.

The Onslow, Tom Price and Paraburdoo townsites and surrounds include land within a designated bushfire prone area (see Figure 1, Figure 2 and Figure 3). In line with State Planning Policy No. 3.7 Planning in Bushfire Prone Areas (SPP3.7) and the Planning in Bushfire Prone Areas Guidelines (WAPC, 2015), a bushfire hazard level assessment is necessary to inform the local planning strategy, and ensure that areas of new land use and intensification in bushfire prone areas appropriately consider bushfire hazard.

Appendix A includes strategy plans from the draft local planning strategy that identify those areas planned for urban expansion or intensification of development.

1.2 Purpose of this report

This report provides a bushfire hazard level assessment for future investigation and infill areas identified on the Shire of Ashburton Local Planning Strategy town site strategy plans for Tom Price, Onslow and Paraburdoo. This report assesses bushfire recommendations of the local planning strategy against the bushfire protection criteria set out in technical appendices to the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015). The report makes recommendations for how the local planning strategy should respond to bushfire risk.

This report provides a technical appendix to Part 2 of the Shire of Ashburton Local Planning Strategy.

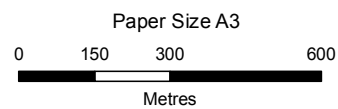
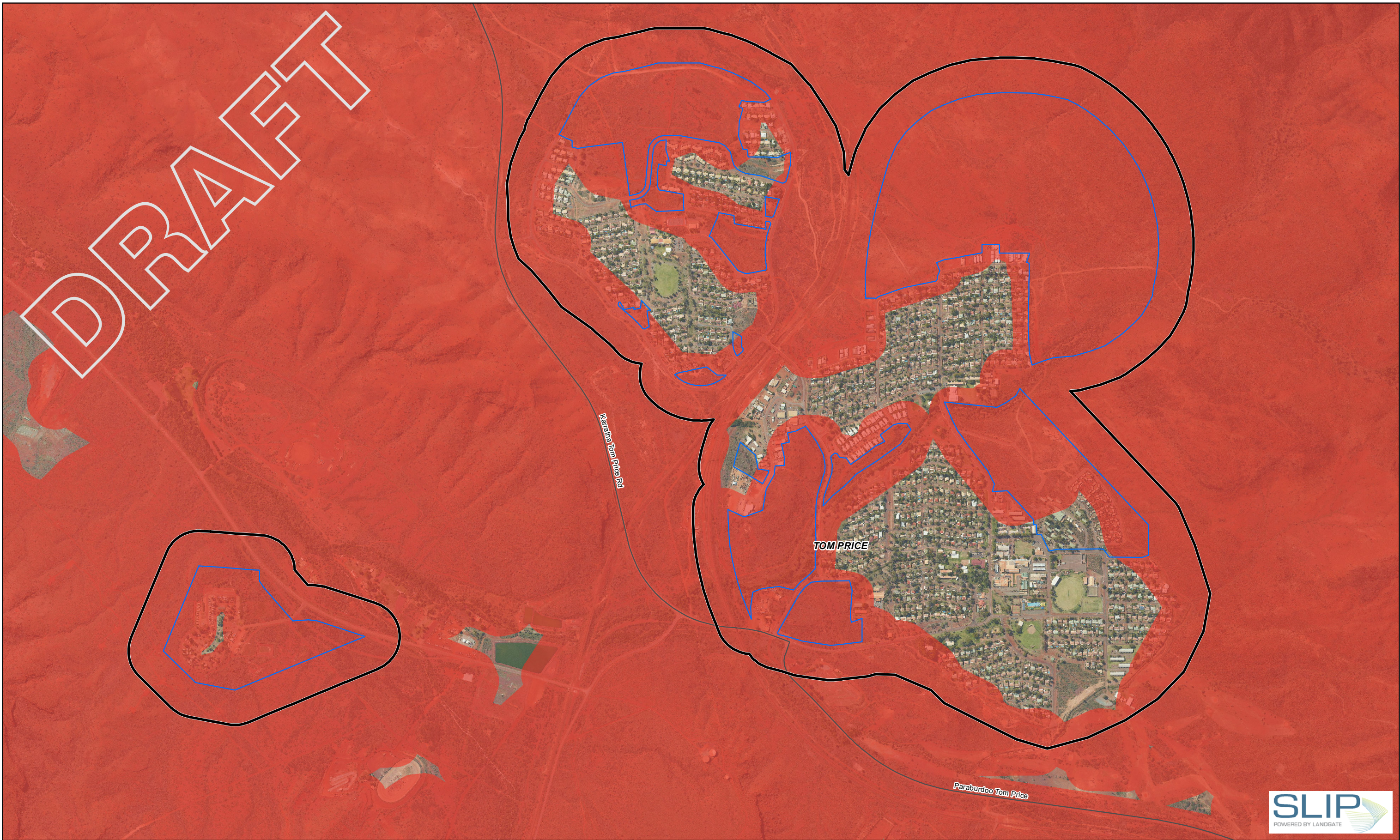
The objectives of the bushfire hazard level assessment are:

- To undertake a bushfire hazard level assessment for those area(s) being considered for urban expansion or intensification of development; and
- To identify those areas with a moderate or extreme hazard rating, that require a more detailed analysis before any development / subdivision occurs.

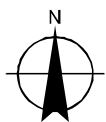


LEGEND

- Local Road
- Bushfire Hazard Level Assessment Area
- Bushfire Prone Areas



Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50



LEGEND

- State Road
- Investigation Area
- Bushfire Hazard Level Assessment Area
- Bushfire Prone Areas



Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

Tom Price Bushfire Prone Areas

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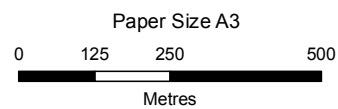
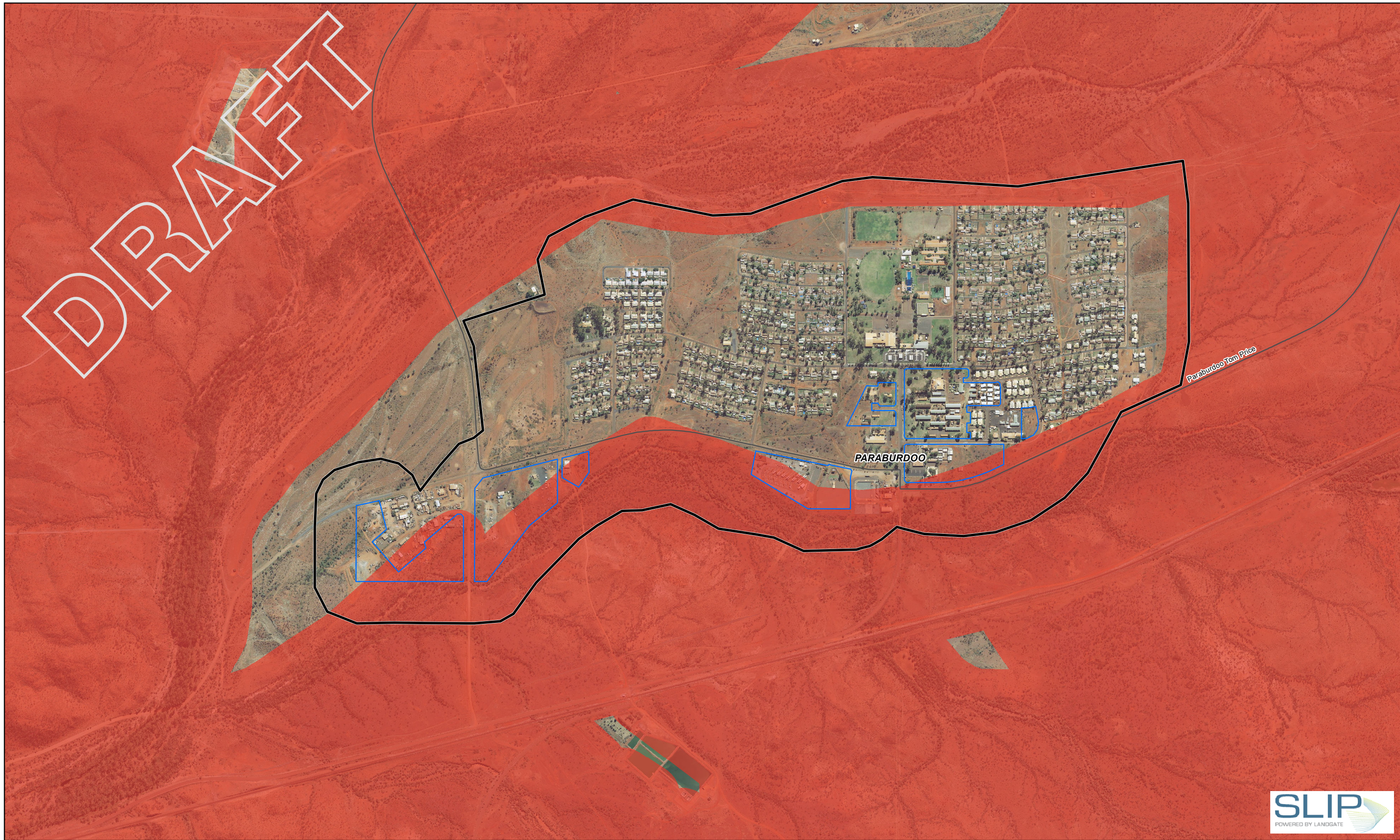
Figure 2

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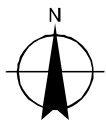
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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50



LEGEND

- State Road
- Investigation Area
- Bushfire Hazard Level Assessment Area
- Bushfire Prone Areas



Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

Paraburdoo Bushfire Prone Areas

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Figure 3

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1.3 Scope and limitations

This report has been prepared by GHD for the Shire of Ashburton and may only be used and relied on by the Shire of Ashburton for the purpose agreed between GHD and the Shire of Ashburton as set out in section 1.2 of this report.

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The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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GHD has not been involved in the preparation of the Shire of Ashburton Local Planning Strategy and has had no contribution to, or review of the Shire of Ashburton Local Planning Strategy other than in the Shire of Ashburton Local Planning Strategy Bushfire Hazard Level Assessment. GHD shall not be liable to any person for any error in, omission from, or false or misleading statement in, any other part of the Shire of Ashburton Local Planning Strategy.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by site access and the location of public viewpoints. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

The vegetation classifications in this document are for the purpose of indicative broad bushfire hazard levels only. The classifications should not be used for any other purpose, and should not be used as the basis of determining bushfire attack levels (BAL) or BAL contour maps for any sites.

2. Bushfire Hazard Level Assessment

2.1 Methodology

The bushfire hazard level assessment was undertaken in accordance with Appendix 2 of the Guidelines for Planning in Bushfire Prone Areas (as amended).

The bushfire hazard level assessment area was determined as all future investigation areas identified in the draft local planning strategy, with a 150 metre buffer. This area was modified slightly in some locations to incorporate additional, nearby bushfire prone land, or clipped where the study area overlapped with significant waterways and ocean.

Vegetation in the study area was classified in accordance with Table 2.3 of AS3959-2009 (as amended) and the Visual Guide for Bushfire Risk Assessment in Western Australian (Department of Planning, 2016). The classification of vegetation was based on interrogation of the most recently available aerial photography, verified by numerous field assessment points.

Consistent with the broad-brush nature of a bushfire hazard level assessment, the most appropriate vegetation classification was determined for contiguous stands of vegetation that broadly share similar structures and anticipated fire behaviour, although some minor variability may be recorded at individual assessment points across the sites. Any variation in vegetation within stands that would result in a higher hazard level was individually mapped (e.g. a minor area of low shubland within a larger grassland area may not be separately mapped, however any areas of scrub would be). Being a broad-brush assessment, the classification took a conservative approach in relation to defining vegetation classes. Future assessments of bushfire attack level which look at smaller extents of vegetation may result in lesser classifications.

Mapped vegetation classes were combined with slope analysis based on available contour data to model the appropriate bushfire hazard level. In line with AS3959, effective slope was calculated over 100 metres, to smooth out short variations in slope/land undulation that would not influence bushfire hazard level.



2.2 Onslow Townsite

2.2.1 Vegetation Classification Mapping

Vegetation across the Onslow area reflects grassland and shrubland vegetation classifications described in AS3959. The vegetation classes are described in Table 1. Figure 4 illustrates the broad distribution of vegetation classes across the bushfire hazard level assessment area.

Appendix A provides field observations and identification of vegetation class for the 46 assessment points analysed in Onslow.

Table 1 Vegetation Classes – Onslow Townsite

Vegetation class	Representative photo
<p>Class G - Grassland</p> <p>All grassland forms, including situations with shrubs and trees, if the overstorey foliage cover is less than 10 percent (AS3959, Table 2.3)</p> <p>Landscape dominated by spinifex grasses, with occasional (foliage cover less than 10 percent) low shrubs. Some locations with scattered trees and larger shrubs.</p>	
<p>Class C - Shrubland</p> <p>Shrubs <2m high; greater than 30 percent foliage cover. Understoreys may contain grasses. (AS3959, Table 2.3)</p> <p>Landscape dominated by spinifex grasses, with varying density (greater than 10 percent, up to 40 percent in some areas) of low shrubs. Some locations with scattered trees and larger shrubs.</p>	



LEGEND

Assessment Point

Local Road

Investigation Area

Bushfire Hazard Level Assessment Area

Vegetation Classification

Class C - Shrubland

Class G - Grassland

0200400800

Metres

Paper Size A3

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 50

Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

Onslow
Vegetation Classes

Job Number	61-36178
Revision	A
Date	09 Aug 2017

Figure 4

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2.2.2 Bushfire hazard level mapping

Bushfire hazard level in Onslow is predominantly influenced by vegetation classification; however there are small areas across the townsite where a slope greater than 10 degrees influences hazard level.

Figure 5 provides the modelled bushfire hazard level for Onslow Townsite. The townsite is located within a landscape reflecting a moderate bushfire hazard that will influence areas of development abutting areas of remnant vegetation.

The bushfire hazard level assessment methodology set out in the Planning in Bushfire Prone Areas Guidelines is a very broad-brush definition of hazard levels, and the actual hazard and anticipated bushfire behaviours based on vegetation characteristics within the defined hazard levels may vary.

In line with the bushfire hazard level assessment methodology, any areas within 100 metres of vegetation classified as a moderate or extreme level have been mapped as moderate. This takes into account radiant heat and ember attack that would be experienced by development in close proximity to bushfire prone vegetation. In line with AS3959, any development within 100 metres of most vegetation types is anticipated to experience some level of radiant heat and ember attack. However, for lower threat/intensity vegetation classes – in particular the grassland and low shrubland vegetation classes identified in Onslow – 100 metres is likely to be overstating the actual hazard. AS3959 identifies development at a distance greater than 50 metres from these low threat vegetation classes as BAL-LOW, meaning there is insufficient risk to warrant specific bushfire requirements beyond 50 metres from the lower level bushfire prone vegetation.

The specific nature of the low shrubland and spinifex grassland areas in and around Onslow will have similar fuel loads and fire behaviour (wind driven), despite being classified as separate classes according to Table 2.3 in AS3959. As a result, whilst shrubland areas are classified as Class C in this assessment on the basis of a shrub overstorey in excess of ten percent, these low shrublands would exhibit similar fire behaviour to grassland types, and are more aligned with the grassland assumptions set out in the detail of AS3959. This does not influence the determination of bushfire hazard (as both vegetation classes reflect a moderate hazard level) however should be considered in any future site level assessments undertaken in response to detailed bushfire risk and exposure.



LEGEND

Local Road

Bushfire Hazard Level Assessment Area

Investigation Area

Bushfire Hazard Level

Low

Moderate

Extreme

Paper Size A3

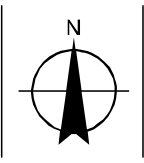
0 200 400 800

Metres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 50



Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

Onslow
Bushfire Hazard Level Assessment

Job Number 61-36178
Revision B
Date 09 Aug 2017

Figure 5


2.3 Tom Price

2.3.1 Vegetation classification


Vegetation within Tom Price reflects grassland and low shrubland vegetation classes, with increasing density and height of vegetation occurring with wetter conditions along drainage lines. This generates ribbons of scrub and open woodland, with small pockets of forest where the scrub understorey occurs with larger trees along the river.

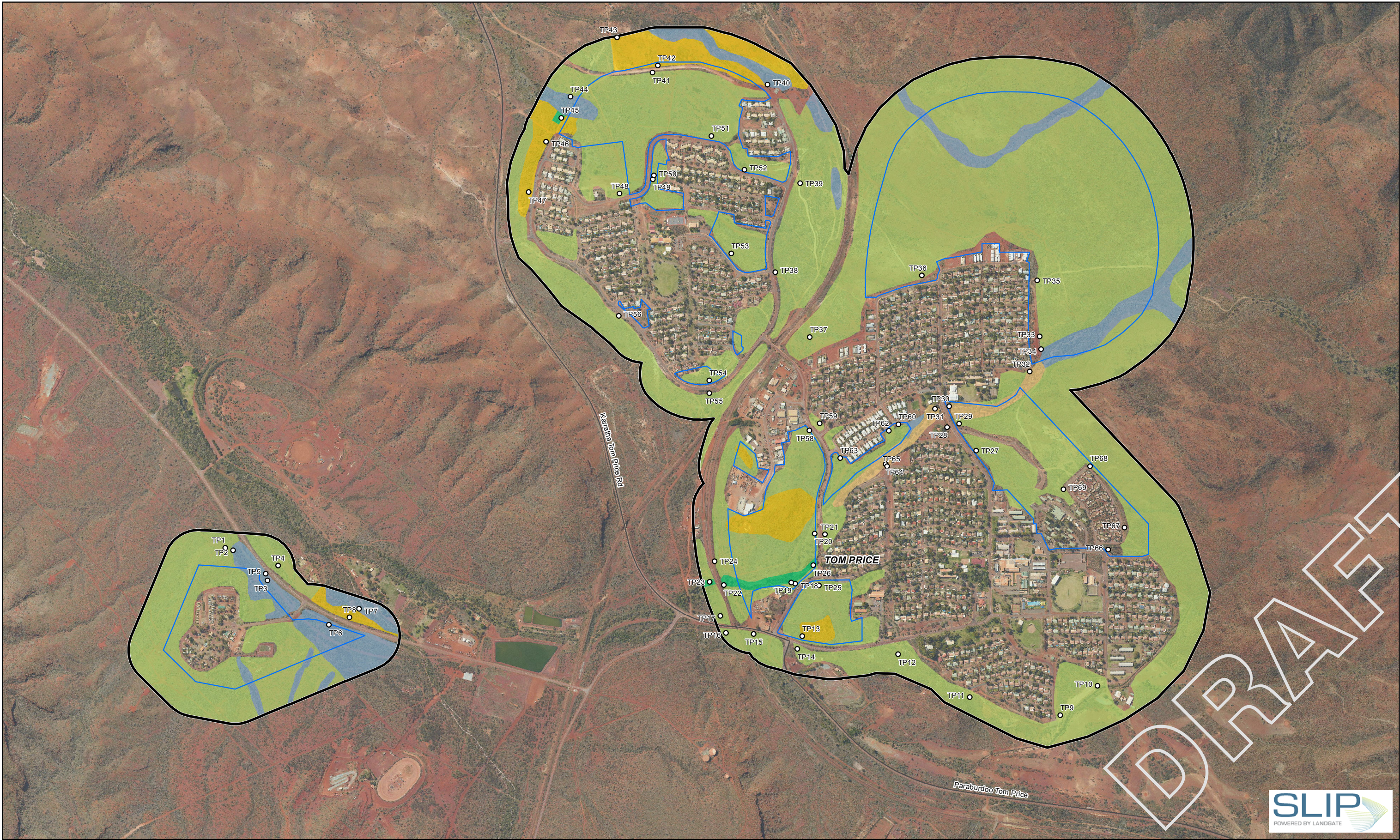
Table 2 describes the vegetation classes that occur in the area. Figure 6 illustrates the distribution of vegetation classes across the bushfire hazard level assessment area. Appendix A provides field observations and identification of vegetation class for 69 site locations assessed across Tom Price.

Table 2 Vegetation Classes – Tom Price Townsite

Vegetation class	Representative photo
<p>Class G - Grassland</p> <p>All grassland forms, including situations with shrubs and trees, if the overstorey foliage cover is less than 10 percent (AS3959, Table 2.3)</p> <p>Landscape dominated by spinifex grasses, with occasional (foliage cover less than 10 percent) low shrubs. Some locations with scattered trees and larger shrubs.</p>	
<p>Class C - Shrubland</p> <p>Shrubs <2m high; greater than 30 percent foliage cover. Understoreys may contain grasses. (AS3959, Table 2.3)</p> <p>Landscape dominated by spinifex grasses, with varying density (greater than 10 percent, up to 40 percent in some areas) of low shrubs. Some locations with scattered trees and larger shrubs.</p>	

Vegetation class	Representative photo
<p>Class D - Scrub</p> <p>Shrubs greater than 2 m high; 10-30% foliage cover with a mixed species composition (AS3959, Table 2.3)</p> <p>Taller shrublands, with foliage cover of 15 to 20% over grasses. Associated with greater water availability in and around drainage lines and watercourses.</p>	
<p>Class B - Woodland</p> <p>Open Woodland B-06</p> <p>Trees 10-30 m high; 10-30% foliage cover dominated by eucalypts. (AS3959, Table 2.3).</p> <p>Linear areas of trees over a highly degraded, grassland understorey. Foliage cover ~10%. Associated with watercourse areas.</p>	

Vegetation class	Representative photo
<p>Class A – Forest</p> <p>Open Forest A-03</p> <p>Trees 10-30m high: 30-70% foliage cover (may include understorey of low trees and tall shrubs or grass) (AS3959, Table 2.3)</p> <p>Linear areas with trees over a multi-tiered understorey of shrubs, grass and reeds. Associated with river.</p>	



2.3.2 Bushfire hazard level

Bushfire hazard level in Tom Price is influenced by vegetation classification. Figure 7 provides the modelled bushfire hazard level for Tom Price.

The townsite is located within a landscape reflecting, in general, a moderate bushfire hazard that will influence development abutting remnant vegetation. Smaller areas of extreme hazard occur as a result of more intense vegetation types and areas of higher slope.

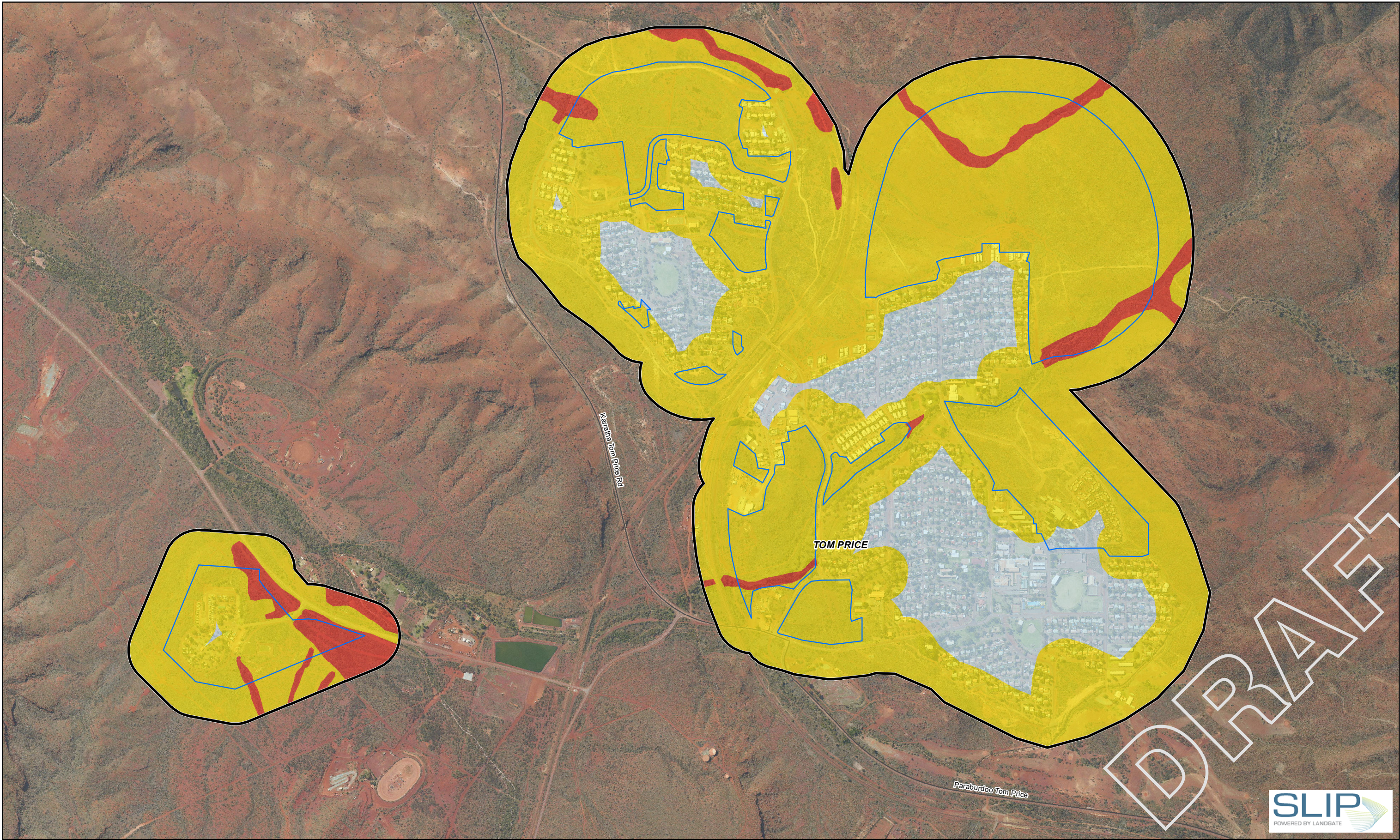
The bushfire hazard level assessment methodology set out in the Planning in Bushfire Prone Areas Guidelines is a very broad-brush definition of hazard levels, and the actual hazard and anticipated bushfire behaviours based on vegetation classifications within the defined hazard levels may vary.

Areas of extreme hazard mapped through and near the townsite result from increased density and height of vegetation with watercourses and drainage lines. Being restricted to narrow areas associated with watercourses, the extent of these scrub, woodland and forest areas would be insufficient to generate the maximum fire behaviour generated by AS3959 modelling assumptions, and therefore will not result in the fire behaviour expected of larger, contiguous areas of those vegetation classes. Whilst mapped as extreme in line with the bushfire hazard level assessment methodology, the ribbons of extreme hazard are not of a spatial extent that would generate that risk in reality.

In line with the bushfire hazard level assessment methodology, any areas within 100 metres of vegetation classified as a moderate or extreme level have been mapped as moderate. This requirement takes into account radiant heat and ember attack that would be experienced by development in close proximity to bushfire prone vegetation. In line with AS3959, any development within 100 metres of most vegetation types is anticipated to experience some level of radiant heat and ember attack. However, for lower threat/intensity vegetation classes – in particular the grassland and low shrubland vegetation classes identified in Tom Price – 100 metres is likely to be overstating the actual hazard. AS3959 identifies development at a distance greater than 50 metres from these low threat vegetation classes as BAL-LOW, meaning there is insufficient risk to warrant specific bushfire requirements beyond 50 metres from the lower level bushfire prone vegetation.

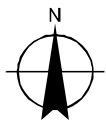
The specific nature of the low shrubland and spinifex grassland areas in and around Tom Price will have similar fuel loads and fire behaviour (wind driven), despite being classified as separate classes according to Table 2.3 in AS3959. As a result, whilst low shrubland areas are classified as Class C in this assessment on the basis of a shrub overstorey in excess of ten percent, these low shrublands would exhibit similar fire behaviour to grassland types, and are more aligned with the grassland assumptions set out in the detail of AS3959. This does not influence the determination of bushfire hazard (as both vegetation classes reflect a moderate hazard) however should be considered in any future site level assessments undertaken in response to detailed bushfire risk and exposure.

Any areas of extreme bushfire hazard within investigation areas are anticipated to be cleared to facilitate development.



Paper Size A3
0 150 300 600
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50



LEGEND

- | | |
|----------------------|-----------------------|
| — State Road | Bushfire Hazard Level |
| □ Investigation Area | □ Low |
| □ Survey Area | □ Moderate |
| | □ Extreme |



Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

Tom Price Bushfire Hazard Level Assessment

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Revision	B
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Figure 7

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2.4 Paraburdoo

2.4.1 Vegetation classification

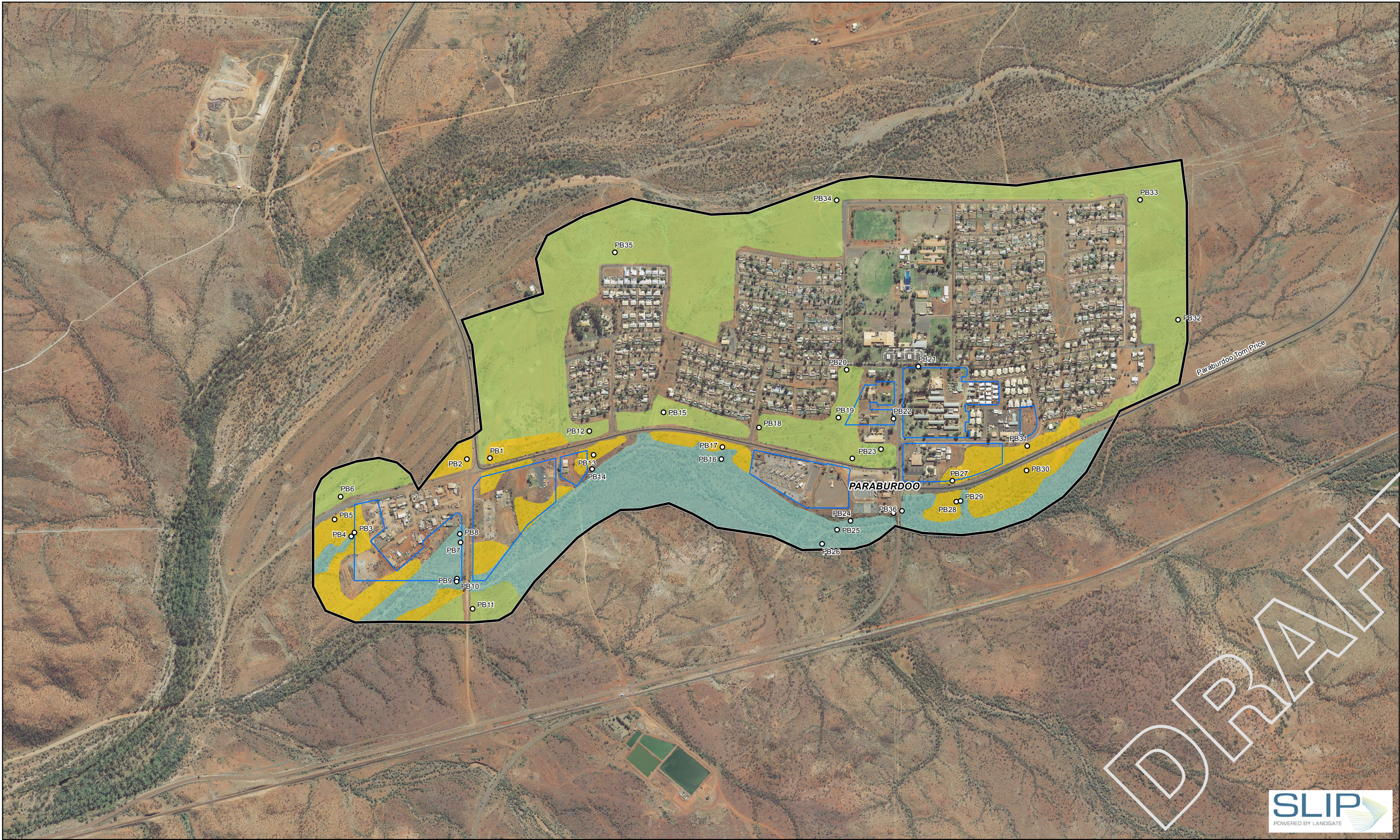
Vegetation across the Paraburdoo bushfire hazard level assessment area reflects grassland and shrubland vegetation classifications described in AS3959, with areas of low woodland associated with a drainage line to the south of the town. Table 3 describes the vegetation classes that occur in the area. Figure 8 illustrates the distribution of vegetation classes across the bushfire hazard level assessment area. Appendix A provides field observations and identification of vegetation class for 38 site assessment points.

Table 3 Vegetation Classes – Paraburdoo Townsite

Vegetation class	Representative photo
<p>Class G - Grassland</p> <p>All grassland forms, including situations with shrubs and trees, if the overstorey foliage cover is less than 10 percent (AS3959, Table 2.3)</p> <p>Landscape dominated by spinifex grasses, with occasional (foliage cover less than 10 percent) low shrubs. Some locations with scattered trees and larger shrubs.</p>	
<p>Class C - Shrubland</p> <p>Shrubs <2m high; greater than 30 percent foliage cover. Understoreys may contain grasses. (AS3959, Table 2.3)</p> <p>Landscape characterised by spinifex grasses, with varying density (greater than 10 percent, up to 40 percent in some areas) of low shrubs. Some locations with scattered trees and larger shrubs.</p>	

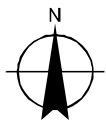
Vegetation class	Representative photo
<p>Class B - Woodland</p> <p>Low Woodland B-07</p> <p>Low trees and shrubs 2-10 m higher. Often have a grassy understorey or low shrubs (AS3959, Table 2.3).</p> <p>Low trees (5 to 8 metres) over grassland and low shrubland in areas associated with watercourse/drainage line to the south of Paraburdoo.</p>	

DRAFT



Paper Size A3
0 125 250 500
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50



LEGEND

- Assessment Point
- State Road
- Investigation Area
- ▭ Bushfire Hazard Level Assessment Area

Vegetation Classification

- Class B - Woodland, Low Woodland (07)
- Class C - Shrubland
- Class G - Grassland



Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

Paraburdo Vegetation Classes

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Figure 8

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2.4.2 Bushfire hazard level

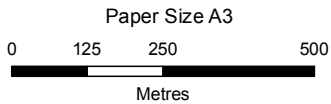
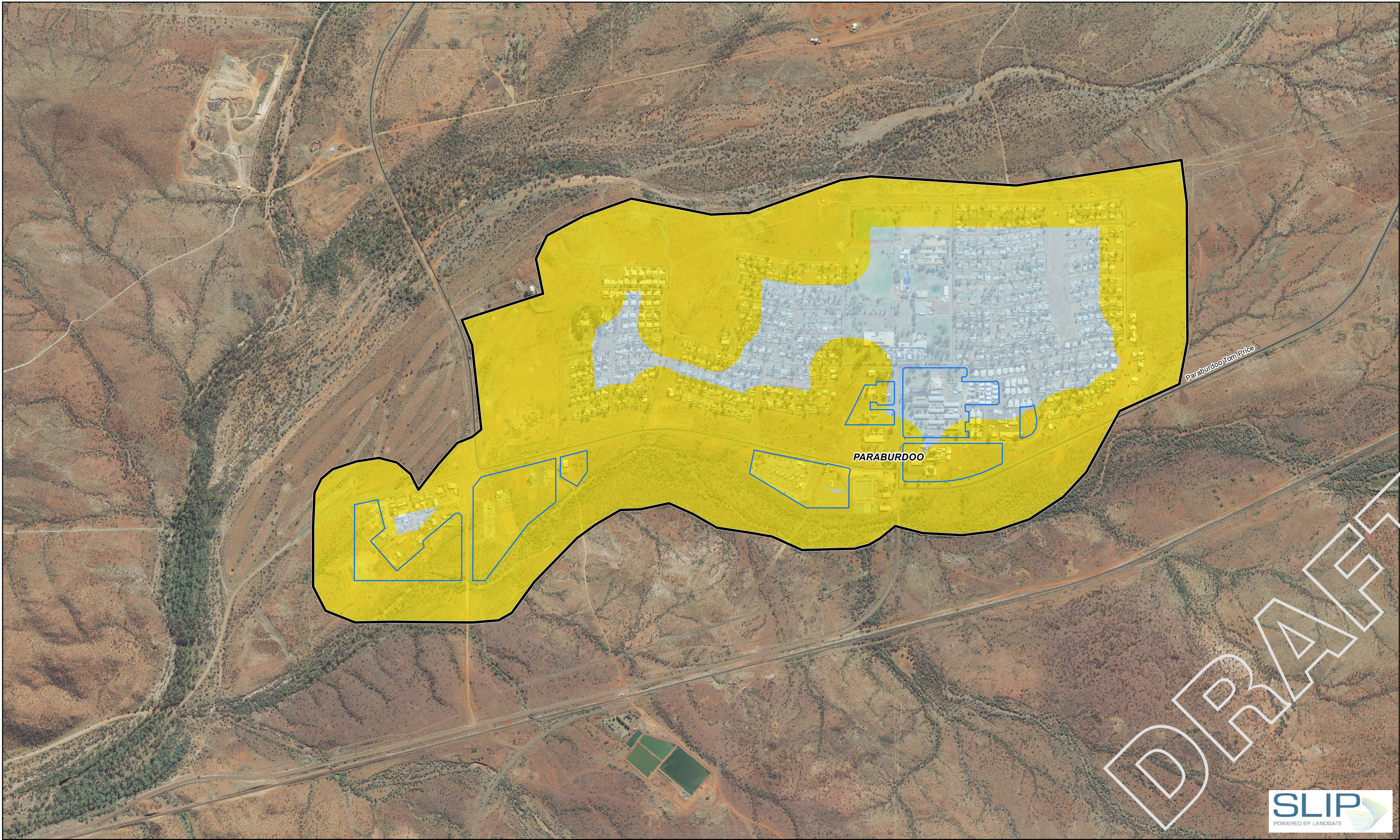
Bushfire hazard level in Paraburdoo is solely influenced by vegetation classification. Figure 9 provides the modelled bushfire hazard level for Paraburdoo Townsite.

The townsite is located within a landscape reflecting a moderate bushfire hazard that will influence development abutting remnant vegetation.

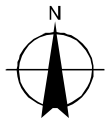
The bushfire hazard level assessment methodology set out in the Planning in Bushfire Prone Areas Guidelines is a very broad-brush definition of hazard levels, and the actual hazard and anticipated bushfire behaviours based on vegetation classifications within the defined hazard levels may vary.

In line with the bushfire hazard level assessment methodology, any areas within 100 metres of vegetation classified as a moderate or extreme level have been mapped as moderate. This requirement takes into account radiant heat and ember attack that would be experienced by development in close proximity to bushfire prone vegetation. In line with AS3959, any development within 100 metres of most vegetation types is anticipated to experience some level of radiant heat and ember attack. However, for areas adjacent to lower threat/intensity vegetation classes – in particular the grassland and low shrubland vegetation classes identified around Paraburdoo – 100 metres is likely to be overstating the actual hazard. AS3959 identifies development at a distance greater than 50 metres from these low threat vegetation classes as BAL-LOW, meaning there is insufficient risk to warrant specific bushfire requirements beyond 50 metres from the lower level bushfire prone vegetation.

The specific nature of the low shrubland and spinifex grassland areas in and around Paraburdoo will have similar fuel loads and fire behaviour (wind driven), despite being classified as separate classes according to Table 2.3 in AS3959. As a result, whilst shrubland areas are classified as Class C in this assessment on the basis of a shrub overstorey in excess of ten percent, these low shrublands would exhibit similar fire behaviour to grassland types, and are more aligned with the grassland assumptions set out in the detail of AS3959. This does not influence the determination of bushfire hazard (as both vegetation classes reflect a moderate hazard level) however should be considered in any future site level assessments undertaken in response to detailed bushfire risk and exposure.



Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50



LEGEND

- | | | |
|-------------|--------------------|---------------------------------|
| State Road | Investigation Area | Bushfire Hazard Level: Low |
| Survey Area | | Bushfire Hazard Level: Moderate |
| | | Bushfire Hazard Level: Extreme |



Shire of Ashburton
Ashburton Bushfire Hazard
Level Assessment

**Paraburdoo
Bushfire Hazard Level Assessment**

Job Number	61-36178
Revision	B
Date	09 Aug 2017

Figure 9

3. Shire of Ashburton Local Planning Strategy

3.1 Compliance with bushfire protection criteria

The future development of investigation areas will result in a reduction of bushfire hazard level, as vegetation is cleared and replaced with low threat development. However, outer areas will continue to be influenced by bushfire risk from vegetation in the surrounding landscape. Future development will have to demonstrate compliance with bushfire protection criteria set out in technical appendices to the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2015).

Bushfire protection criteria assist decision makers assess proposed bushfire risk management measures in strategic planning proposals, subdivisions, or development applications in bushfire prone areas. The criteria relate to four key elements: location, siting and design, vehicular access and water.

The specific performance principles and acceptable solutions for these elements are provided in Appendix B. The majority are matters for design at subsequent planning stages, and will be a component of investigating the suitability of areas for development through local structure plans. In the absence of design, it is not possible to assess these criteria at the level of a local planning strategy. In accordance with SPP 3.7 and associated bushfire planning guidelines, local structure plans and subdivision applications will be assessed against the bushfire protection criteria, and design will need to meet the acceptable solutions, or provide an alternative solution in response to the performance principles. This would be undertaken within the preparation of a bushfire management plan, informed by a more detailed, site specific investigation of bushfire exposure, such as bushfire attack level (BAL) contour maps.

Table 4 presents the performance principles from the bushfire protection criteria, and identifies the expectation for future development in meeting the criteria in later planning proposals.

Generally, based on a moderate bushfire hazard level and the nature of vegetation, all investigation and infill areas are considered capable of meeting the bushfire protection criteria with future design locating access and public open space to achieve access requirements and sufficient asset protection zones to any areas of residual bushfire risk. Provision of reticulated water will meet criteria regarding water supply. Additional care will be required in the detailed planning of some residential infill areas in Tom Price with extensions to the existing road network, and potentially additional managed open space, required in the southeast of town to ensure suitable access and asset protection zones.

Table 4 Compliance with Bushfire Protection Criteria

Element	Location	Siting and design of development	Vehicular access	Water
	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 Department of Fire and Emergency Services and the decision-maker.	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. That it incorporates a defensible 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.	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 easily and safely at all times.	The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.
Onslow				
Urban Investigation Areas	Expected to meet the criteria. Current BHL is moderate.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Transient Worker Accommodation & Short Stay Accommodation	Expected to meet the criteria. Current BHL is moderate.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Future Industry / Mixed Business	Expected to meet the criteria. Current BHL is moderate.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Tom Price				
Urban Investigation Areas	Expected to meet the criteria. Current BHL is moderate.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Residential Infill Areas	Expected to meet the criteria. Current BHL is moderate.	May meet the criteria subject to further investigation and design.	May meet the criteria subject to further investigation and design.	Expected to meet the criteria.
Transient Worker Accommodation & Short Stay Accommodation	Should meet the criteria depending upon the design. Some areas of extreme hazard are located in this area, however are likely to be cleared to facilitate development.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Future Industry / Mixed Business	Should meet the criteria depending upon the design. Some areas of extreme hazard are located in this area, however are likely to be cleared to facilitate development.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Paraburdoo				
Urban Investigation Areas	Expected to meet the criteria. Current BHL is moderate.	Expected to meet the criteria.	Expected to meet the criteria.	Expected to meet the criteria.
Transient Worker Accommodation & Short Stay Accommodation	Expected to meet the criteria. Current BHL is moderate.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.
Future Industry / Mixed Business	Expected to meet the criteria. Current BHL is moderate.	Should meet the criteria depending upon the design.	Should meet the criteria depending upon the design.	Expected to meet the criteria.

3.2 Recommended strategies and actions

Table 5 presents the draft planning strategies and actions set out in the draft Shire of Ashburton Local Planning Strategy. These have been reviewed in line with the bushfire hazard level assessment.

Table 5 Bushfire strategies and actions from draft Local Planning Strategy

Strategies	Actions
Bush Fire Risk <ol style="list-style-type: none"> 1. Promote the appropriate management of bush fire risks to Townsites and Aboriginal communities. 2. Promote appropriate management of bush fire risks to remote camps, tourism sites and pastoral homesteads. 3. Identify improvements to the road network to ensure that vehicle access and egress is available and safe during a bushfire event. 	Bush Fire Risk <ol style="list-style-type: none"> 1. Ensure future planning and development within Bush Fire Prone Areas meets the requirements of State Planning Policy 3.7: <i>Planning in Bushfire Prone Areas</i> and the <i>Guidelines for Planning in Bushfire Prone Areas</i>. 2. For existing developed areas that have an extreme BHL, implement risk management measures that help reduce the risk to 'low' to 'moderate'. 3. Prior to rezoning land identified for a future change in use or intensification of use/ development, a BHL assessment shall be undertaken and, where there are areas identified as 'moderate' to 'extreme', a Bushfire Management Plan shall also be prepared. 4. Consider the location of fire service access routes in semi-rural areas around townsites and emergency management.

In line with this bushfire hazard level assessment, some modifications to the draft actions are appropriate to better reflect the hazard levels determined.

Action 1 is an appropriate planning response to the bushfire hazard in the key townsites. The role of a local planning strategy is to provide an effective local planning framework to address key issues in local planning processes and decisions. The state policy framework regarding bushfire risk is very well developed, and applies clearly to local planning applications and decisions. Therefore, the Shire of Ashburton Local Planning Strategy does not require additional policy response to address bushfire risk, as it is adequately dealt with by the existing policy framework. Whilst this bushfire hazard level assessment has modelled bushfire hazard in some areas outside the bushfire prone area mapping, development controls set out in the state planning framework should only be applied to areas within the designated bushfire prone area. In some instances, the bushfire hazard level assessment methodology results in a defined hazard level that overstates the actual bushfire hazard for developed areas within Onslow, Tom Price and Paraburdoo. It would be unnecessary and onerous to apply the policy framework to areas outside the designated bushfire prone areas, even if this assessment has mapped a moderate bushfire hazard level for the land.

With respect of Action 2, no existing developed areas were identified as having an extreme bushfire hazard level, although some areas in Tom Price are located near to small areas of extreme hazard. The spatial extent and small size of the mapped extreme hazard areas means that, in reality, the overall hazard presented to existing development is likely to be of a moderate level. Therefore, Action 2 may not be necessary in the local planning strategy. Overall bushfire risk to existing development in the townsites should be managed through ongoing fuel management activities, such as maintaining firebreaks and land management, and through continual review and updating of emergency management plans and procedures, including

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planning for emergency and fire access. Any redevelopment of these areas would consider risk in accordance with SPP3.7 and deemed provisions within the Shire of Ashburton Local Planning Scheme.

Action 3 may be considered redundant, as the bushfire hazard level assessment has been undertaken. It would be beneficial, instead, to confirm the need for more detailed understanding of likely bushfire exposure for individual development areas. In line with SPP3.7, structure plans for investigation areas should develop a bushfire attack level (BAL) contour map – taking into account areas to be cleared for development, locations of future roads and open spaces. This will determine the residual bushfire exposure risk to future development, enable detailed consideration of the bushfire protection criteria, and identify the need for any future construction standards in line with AS3959.

Action 4 presents an appropriate recommendation to enhance emergency access in semi-rural areas, however it is not clear as to what the mechanism for this action would be. It is recommended that a specific mechanism – such as an emergency management plan – be identified to more clearly articulate the project necessary for delivery to achieve the desired action.

DRAFT

4. Conclusion

Potential townsite expansion areas in Tom Price, Paraburdoo and Onslow are influenced, for the most part, by a moderate bushfire hazard level. Whilst pockets of extreme hazard level were modelled and mapped within Tom Price, the small size and spatial extent of these areas makes it unlikely that they would present an extreme hazard in reality. The moderate hazard influencing the towns will have implications for future planning.

Assessment of the urban investigation and infill areas against the relevant bushfire protection criteria of the Planning in Bushfire Prone areas Guidelines suggests that, subject to design, these areas can be developed in accordance with the requirements of State Planning Policy 3.7, the guidelines, and all supporting appendices. Subsequent strategic planning for the expansion areas will need to consider appropriate services provision, vehicular access, and site design to meet state policy requirements.

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Appendices

Appendix A – Draft Strategy Plans

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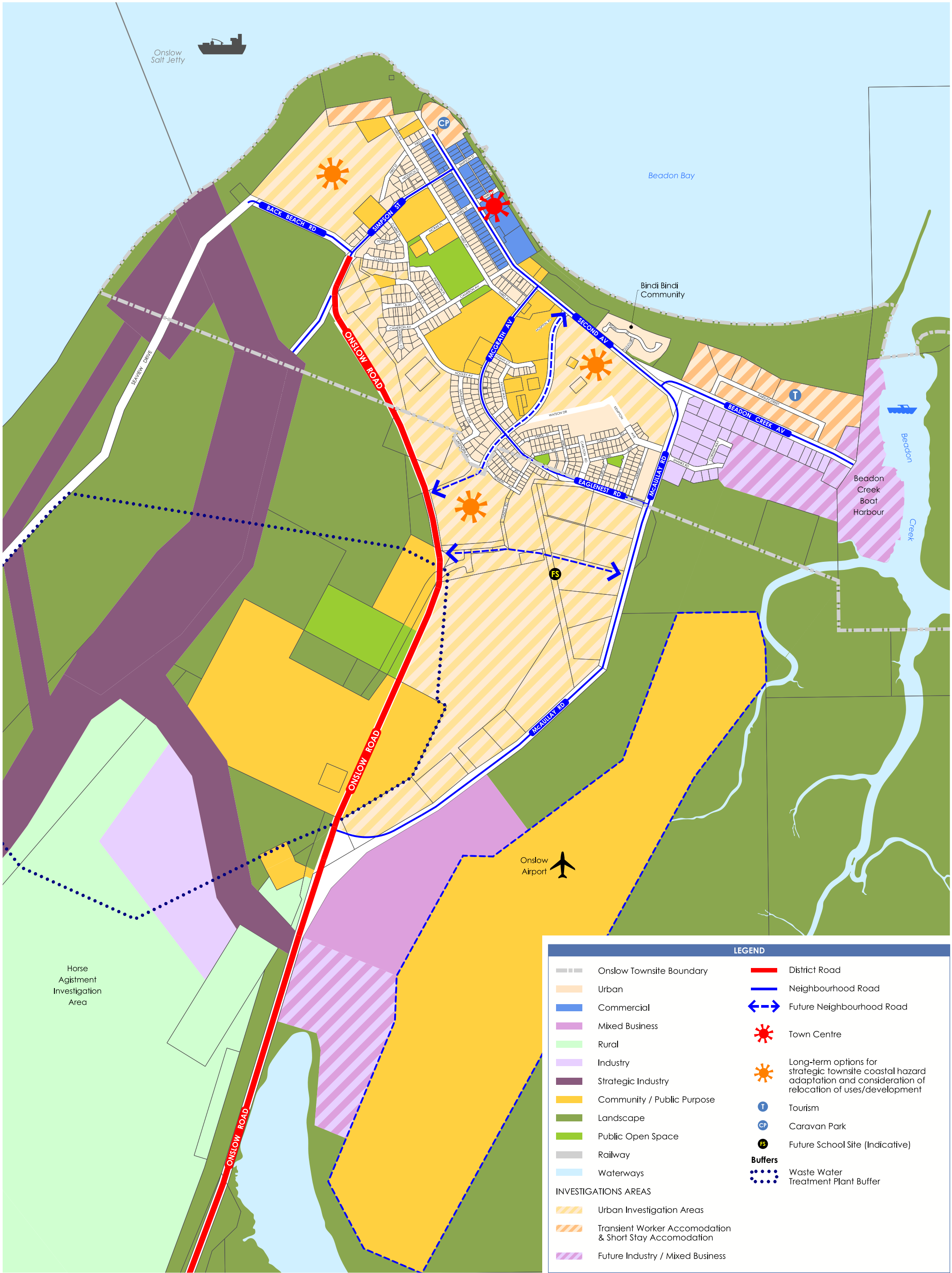


LEGEND

Paraburdoo Townsite Boundary	District Road
Urban	Neighbourhood Road
Commercial	Residential Infill Areas
Industry	Town Centre
Community / Public Purpose	Tourism
Rural	Caravan Park
Landscape	
Public Open Space	
Railway	

INVESTIGATION AREAS

Urban Investigation Areas
Transient Worker Accommodation & Short Stay Accommodation
Future Industry / Mixed Business



Appendix B – Field observations

DRAFT

PPOINT_ID	VEG_CLASS	NOTES
Onslow1	G	E facing photo, 85% cover, no foliage
Onslow2	C	PO - S; H = <1.0m; GC = 20%; Other: some grass, salt marsh
Onslow3	C	1. PO - SE; 2. Shrubs (saltbush) with grass - 40% saltbush foliage, 3. Grass, 4. <0.8m
Onslow4	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 90% grass 10% shrub, 4. Foliage cover = <10%, 5. Dominant height = <1.0m
Onslow5	G	1. Photo facing- SW, 2. Dominant veg - Grass, 3. Ground cover = 70% grass 5% shrub 25% soil, 4. Foliage cover = <5%, 5. Dominant height = <1.0m
Onslow6	G	1. Photo facing- N, 2. Dominant veg - Grass, 3. Ground cover = 80% grass 5% shrub 15% soil, 4. Foliage cover = <5%, 5. Dominant height = <1.0m
Onslow7	G	1. Photo facing- ESE, 2. Dominant veg - Grass, 3. Ground cover = 75% grass 5% shrub 20% soil, 4. Foliage cover = <5%, 5. Dominant height = <1.0m
Onslow8	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 85% grass 5% shrub 10% soil, 4. Foliage cover = <5%, 5. Dominant height = <1.0m
Onslow9	G	1. Photo facing- E, 2. Dominant veg - Grass, 3. Ground cover = 85% grass 5% shrub 10% soil, 4. Foliage cover = <5%, 5. Dominant height = <1.0m
Onslow10	C	1. Photo facing- S, 2. Dominant veg - Scrub, 3. Ground cover = 5% shrub 95% soil, 4. Foliage cover = <5%, 5. Dominant height = <0.5m
Onslow11	G	1. Photo facing- ENE, 2. Dominant veg - Grass, 3. Ground cover = 85% grass 5% shrub 10% soil, 4. Foliage cover = <5%, 5. Dominant height = <1.0m
Onslow12	G	1. Photo facing- ESE, 2. Dominant veg - Grass, 3. Ground cover = 70% grass 10% shrub 20% soil, 4. Foliage cover = 5-10%, 5. Dominant height = <1.0m
Onslow13	C	1. Photo facing- NE, 2. Dominant veg - Shrubs, 3. Ground cover = 25% shrub <5 tree 70% soil, 4. Foliage cover = <25%, 5. Dominant height = 1.0-1.5m
Onslow14	G	1. Photo facing- W, 2. Dominant veg - Grass, 3. Ground cover = 65% grass 15% shrub 20% soil, 4. Foliage cover = 10-15%, 5. Dominant height = <1.0m
Onslow15	G	1. Photo facing- NNE, 2. Dominant veg - Grass, 3. Ground cover = 60% grass 20% shrub 20% soil, 4. Foliage cover = 20%, 5. Dominant height = <1.0m
Onslow16	G	1. Photo facing- SE, 2. Dominant veg - Grass, 3. Ground cover = 10% grass 15% shrub 15% soil, 4. Foliage cover = 20%, 5. Dominant height = <1.0m
Onslow17	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 45% grass 10% shrub 45% soil, 4. Foliage cover = 10%, 5. Dominant height = <1.0m
Onslow18	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 35% grass 25% shrub 40% soil, 4. Foliage cover = 25%, 5. Dominant height = <1.0m
Onslow19	G	1. Photo facing- NE, 2. Dominant veg - Grass, 3. Ground cover = 35% grass 20% shrub/tree 45% soil, 4. Foliage cover = 15%, 5. Dominant height = <1.0m
Onslow20	G	1. Photo facing- SSE, 2. Dominant veg - Grass, 3. Ground cover = 55% grass 10% shrub 35% soil, 4. Foliage cover = 5-10%, 5. Dominant height = <1.0m
Onslow21	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 40% grass 5% shrub 55% soil, 4. Foliage cover = <5%, 5. Dominant height = <0.5m
Onslow22	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 45% grass 15% shrub 40% soil, 4. Foliage cover = 10-15%, 5. Dominant height = <1.0m
Onslow23	O	1. Photo facing - SSE. Now developed
Onslow24	G	1. Facing- ESE, 2. Dominant veg - Grass, 3. GC = 55% grass 20% shrub & tree 25% soil, 4. Foliage cover = 20% (in gully), 5. Dominant height = <1.0m

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PPOINT_ID	VEG_CLASS	NOTES
Onslow25	G	1. Photo facing- S, 2. Dominant veg - Grass, 3. Ground cover = 85% grass 5% shrub 10% soil, 4. Foliage cover = 5%, 5. Dominant height = <1.0m
Onslow26	C	1. Photo facing- WSW, 2. Dominant veg - Shrubs, 3. Ground cover = 40% shrubs 10% grass 50% soil, 4. Foliage cover = 30%, 5. Dominant height = <1.0m
Onslow27	C	1. Photo facing- SSW, 2. Dominant veg - Shrubs, 3. Ground cover = 40% grass 35% shrub 25% soil, 4. Foliage cover = 30-40%, 5. Dominant height = 1.5m
Onslow28	G	1. Photo facing- SSW, 2. Dominant veg - Grass, 3. Ground cover = 45% grass 15% shrub 40% soil, 4. Foliage cover = 10-15%, 5. Dominant height = <1.0m
Onslow29	C	1. Photo facing- W, 2. Dominant veg - Shrubs, 3. Ground cover = 25% shrub 10% Grass 65% soil, 4. Foliage cover = 20%, 5. Dominant height = <1.0m
Onslow30	G	1. Photo facing- NE, 2. Dominant veg - Grass, 3. Ground cover = 70% grass 10% shrub 20% soil, 4. Foliage cover = 10%, 5. Dominant height = <1.0m
Onslow30	G	1. Photo facing- N, 2. Dominant veg - Grass, 3. Ground cover = 85% grass 5% shrub 10% soil, 4. Foliage cover = 5%, 5. Dominant height = <0.5m
Onslow31	G	1. Photo facing- NNE, 2. Dominant veg - Grass, 3. Ground cover = 65% grass 15% shrub 20% soil, 4. Foliage cover = 15%, 5. Dominant height = <1.0m
Onslow32	G	1. Photo facing- NE, 2. Dominant veg - Grass, 3. Ground cover = 45% grass 20% shrub 35% soil, 4. Foliage cover = 15-20%, 5. Dominant height = <1.0m
Onslow33	G	1. Photo facing- NW, 2. Dominant veg - Grass, 3. Ground cover = 90% grass 5% shrub 5% soil, 4. Foliage cover = 5%, 5. Dominant height = <0.5m
Onslow34	G	1. Facing - SW, 2. Dominant veg - Grass, 3. Ground cover = 80% grass 10% shrub & tree 10% soil, 4. Foliage cover = 10%, 5. Dominant height = <1.0m
Onslow35	G	1. Photo facing- ESE, 2. Dominant veg - Grass, 3. Ground cover = 40% grass 15% shrub 45% soil, 4. Foliage cover = 10-15%, 5. Dominant height = <1.0m
Onslow36	G	1. Photo facing- NNE, 2. Dominant veg - Grass, 3. Ground cover = 45% grass 10% shrub 45% soil, 4. Foliage cover = 10%, 5. Dominant height = <1.0m
Onslow37	G	1. Photo facing- SW, 2. Dominant veg - Grass, 3. Ground cover = 55% grass 5% shrub 40% soil, 4. Foliage cover = 5%, 5. Dominant height = <1.0m
Onslow38	G	1. Photo facing- NNW, 2. Dominant veg - Grass, 3. Ground cover = 75% grass 15% shrub 10% soil, 4. Foliage cover = 10-15%, 5. Dominant height = <1.0m
Onslow39	G	1. Photo facing- NNE, 2. Dominant veg - Grass, 3. Ground cover = 40% grass 10% shrub 50% soil, 4. Foliage cover = 10%, 5. Dominant height = <1.0m
Onslow40	G	1. Photo facing- E, 2. Dominant veg - Grass, 3. Ground cover = 80% grass 10% shrub 10% soil, 4. Foliage cover = 10%, 5. Dominant height = <1.0m
Onslow41	G	Non-accessible. 1. PF - S to W, 2. DV - Grass, 3. GC = 45% grass 30% shrub 35% soil, 4. FC = 20-25%, 5. DH = <1.0m
Onslow42	G	1. PF - ESE, 2. DV - Grass, 3. GC = 50% grass 15% shrub 35% soil, 4. FC = 10%, 5. DH = <1.0m
Onslow43	G	1. PF - WSW, 2. DV - Grass, 3. GC = 45% grass 10% shrub 45% soil, 4. FC = 5-10%, 5. DH = <1.0m
Onslow44	C	1. PF - SE, 2. DV - Shrubs, 3. GC = 20% grass 25% shrub 55% soil, 4. FC = ~20%, 5. DH = <1.0m. Other - borderline grassland
Onslow45	C	1. PF - ESE, 2. DV - Grass, 3. GC = 40% grass 30% shrub 30% soil, 4. FC = ~25%, 5. DH = <1.0m. Other - borderline shrubland in places
PB1	C	1. PF - NNE, 2. DV - Shrubs, 3. GC = 35% grass 20% shrub 10% trees 35% soil, 4. FC = ~25%, 5. DH = 1.0-1.5m. Other - some shrub ~2.0m & trees >5m

PPOINT_ID	VEG_CLASS	NOTES
PB2	C	1. PF - NNW, 2. DV - Shrub, 3. GC = 15% grass 15% scrub 70% soil, 4. FC = 10%, 5. DH = <1.0m. Other - some shrub ~2.0m
PB3	C	1. PF - ESE, 2. DV - Shrub, 3. GC = 60% grass 15% scrub 35% soil, 4. FC = 10%, 5. DH = 1.0-1.5m. Other - some shrub ~2.0m
PB4	B	1. PF - SSE, 2. DV - Tree, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 20%, 5. DH = ~8.0m. Other - tree line along edge of polygon
PB5	C	1. PF - SW, 2. DV - Shrub, 3. GC = 25% grass 15% shrub 60% soil, 4. FC = 10%, 5. DH = 1.5-2m. Other - some shrub >2.0m
PB6	G	1. PF - N, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 1.5-2m. Other - some trees 5-10m
PB7	C	1. PF - W, 2. DV - Shrub, 3. GC = 20% grass 10% shrub 70% soil, 4. FC = 5-10%, 5. DH = 1.5m. Other - some shrub >2.0m
PB8	B	1. PF - WSW, 2. DV - Tree, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 15%, 5. DH = ~8.0m. Other - tree line along edge of polygon
PB9	B	1. PF - NW, 2. DV - Tree, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 20%, 5. DH = ~8.0m. Other - along river band, river bed sparse grass & shrub
PB10	B	1. PF - W, 2. DV - Tree, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 20%, 5. DH = ~8.0m. Other - along river band, river bed sparse grass & shrub
PB11	G	1. PF - E, 2. DV - Grass, 3. GC = 15% grass 10% shrub 75% soil, 4. FC = <5%, 5. DH = <0.5m. Other - looks previously cleared
PB12	G	1. PF - W, 2. DV - Grass, 3. GC = 50% grass 5% shrub 45% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB13	C	1. PF - SW, 2. DV - Shrub, 3. GC = 5% grass 15% shrub 80% soil, 4. FC = 5%, 5. DH = 1.5-2.0m. Other - sparse shrub 2.0-4.0m occasional tree 5-10m
PB14	B	1. PF - S, 2. DV - Tree, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 20%, 5. DH = 5m. Other - riverbank vegetation, some taller trees 10-15m
PB15	G	1. PF - NE, 2. DV - Grass, 3. GC = 40% grass 5% shrub 55% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB16	B	1. PF - SW, 2. DV - Tree, 3. GC = 50% grass 10% shrub 40% soil, 4. FC = 10%, 5. DH = ~8.0m.
PB17	O	Showing transition to woodland/scrub
PB18	G	1. PF - ENE, 2. DV - Grass, 3. GC = 40% grass 5% shrub 55% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB19	G	1. PF - NNW, 2. DV - Grass, 3. GC = 40% grass 5% shrub 55% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB19	G	1. PF - ESE, 2. DV - Grass, 3. GC = 35% grass 5% shrub 60% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB20	G	1. PF - SE, 2. DV - Grass, 3. GC = 35% grass 5% shrub 60% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB21	G	1. PF - SSE, 2. DV - Grass, 3. GC = 90% grass 10% soil, 4. FC = 5%, 5. DH = Occasional tree 10-20m, parkland
PB22	O	1. PF - W, 2. DV - Grass, 3. GC = 90% grass 10% soil, 4. FC = 5%, 5. DH = Occasional tree 10-20m, parkland
PB23	G	1. PF - SW, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
PB24	B	1. PF - WSW, 2. DV - Tree, 3. GC = 50% grass 10% shrub 40% soil, 4. FC = 20%, 5. DH = ~6.0m.
PB24	B	1. PF - SW, 2. DV - Tree, 3. GC = 45% grass 15% shrub 40% soil, 4. FC = 15%, 5. DH = ~8.0m.
PB25	B	Riverbed view - 5m post
PB26	B	1. PF - ENE, 2. DV - Tree, 3. GC = 45% grass 15% shrub 40% soil, 4. FC = 10%, 5. DH = ~5.0m.

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PPOINT_ID	VEG_CLASS	NOTES
PB27	C	1. PF - NE, 2. DV - Shrub, 3. GC = 40% grass 15% shrub 45% soil, 4. FC = 5-10%, 5. DH = 1.5m. Other - scattered shrub 2.0m+ and trees 5m+
PB28	C	1. PF - SW, 2. DV - Shrub, 3. GC = 40% grass 20% shrub 40% soil, 4. FC = 5-10%, 5. DH = 1.5m. Other - some scattered shrub 2.0m+ and trees 5m+
PB29	B	1. PF - SS, 2. DV - Tree, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 20%, 5. DH = 10m+m. Other - follows drainage
PB30	C	1. PF - S, 2. DV - Shrub, 3. GC = 20% grass 25% shrub 55% soil, 4. FC = 15%, 5. DH = 1.5-2.0m. Other - some shrub 2.0m+ and trees 5m+
PB31	C	1. PF - NE, 2. DV - Shrub, 3. GC = 40% grass 15% shrub 45% soil, 4. FC = 5%, 5. DH = <0.5m. Other - some shrub 2.0m+ and trees 5m+, borderline grassl
PB32	G	1. PF - N, 2. DV - Grass, 3. GC = 50% grass 10% shrub 45% soil, 4. FC = 5%, 5. DH = <1.0m. Other - some shrub 2.0m+
PB33	C	1. PF - SE, 2. DV - Shrub, 3. GC = 25% grass 25% shrub 50% soil, 4. FC = 10%, 5. DH = <0.5m. Other - small shrub mostly, some shrub 2.0m+
PB34	G	1. PF - NNE, 2. DV - Grass, 3. GC = 45% grass 10% shrub 45% soil, 4. FC = 5%, 5. DH = <1.0m. Other - possible shrubland, some shrub 2.0m+
PB35	C	1. PF - SE, 2. DV - Shrub, 3. GC = 40% grass 20% shrub 40% soil, 4. FC = 10-15%, 5. DH = 1.0-1.5m. Other - some trees 2.0m+
PB36	B	1. PF - SE, 2. DV - Tree, 3. GC = 50% grass 10% shrub 40% soil, 4. FC = 20%, 5. DH = ~6.0m. Other - some trees 10m+
TP1	G	1. PF - SW, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m
TP2	D	1. PF - ESE, 2. DV - Scrub, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 30%, 5. DH = 7-8m. Other - some trees 10m+, follows roadside drainage
TP3	D	1. PF - W, 2. DV - Scrub, 3. GC = 50% grass 5% shrub 45% soil, 4. FC = 20%, 5. DH = 7-8m. Other - some trees up to 10m
TP4	G	1. PF - NNW, 2. DV - Grass, 3. GC = 55% grass 5% shrub 40% soil, 4. FC = 5%, 5. DH = 1.0m. Other - bordered by veg similar to TP3, previously cleared?
TP5	D	1. PF - NW, 2. DV - shrub, 3. GC = 50% grass 5% shrub 45% soil, 4. FC = 20%, 5. DH = ~5-6m. Other - typical roadside vegetation
TP6	D	1. PF - NW, 2. DV - shrub, 3. GC = 50% grass 5% shrub 45% soil, 4. FC = 15%, 5. DH = ~5-6m. Other - typical roadside vegetation
TP7	D	1. PF - E, 2. DV - shrub, 3. GC = 35% grass 10% shrub 55% soil, 4. FC = 15-20%, 5. DH = ~5-6m. Other - aligns waterway, woodland?
TP8	C	1. PF - SW, 2. DV - Shrub, 3. GC = 40% grass 30% shrub 30% soil, 4. FC = 30%, 5. DH = 2.0m. Other - dense roadside shrubland
TP9	G	1. PF - NE, 2. DV - Grass, 3. GC = 35% grass 5% shrub 60% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
TP10	G	1. PF - NE, 2. DV - Grass, 3. GC = 35% grass 5% shrub 60% soil, 4. FC = 5%, 5. DH = 0.5m. Other - sparse shrub 1.5-4m occasional tree 10-15m
TP11	G	1. PF - NW, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub/trees 2-10m
TP12	G	1. PF - NW, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some scrub/trees 2-10m
TP13	D	1. PF - NW, 2. DV - Scrub, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 10%, 5. DH = ~7m. Other - trees 10m+
TP14	G	1. PF - NW, 2. DV - Grass, 3. GC = 60% grass 10% shrub 30% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some scrub/trees 2-10m, bordered by scrub
TP15	G	1. PF - SW, 2. DV - Grass, 3. GC = 70% grass 5% shrub 25% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, bordered by shrub

PPOINT_ID	VEG_CLASS	NOTES
TP16	C	1. PF - SW, 2. DV - Shrub, 3. GC = 70% grass 20% shrub 10% soil, 4. FC = 15%, 5. DH = 3.0m. Other - some shrub /trees 5-10m
TP17	G	1. PF - NW, 2. DV - Grass, 3. GC = 70% grass 5% shrub 25% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, bordered by shrub
TP18	G	1. PF - N, 2. DV - Grass, 3. GC = 70% grass 5% shrub 25% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, upper river bank
TP19	A	1. PF - NNW, 2. DV - Trees, 3. GC = 60% grass 30% shrub 10% soil, 4. FC = 50%, 5. DH = 10m+. Other - dense river veg, grass/reeds, understory 5m+
TP20	G	1. PF - SW, 2. DV - Grass, 3. GC = 80% grass 5% shrub 15% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, scrub/woodland aligns river
TP21	G	1. PF - NNE, 2. DV - Grass, 3. GC = 70% grass 5% shrub 25% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, scrub/woodland aligns river
TP23	B	1. PF - SW, 2. DV - Trees, 3. GC = 80% grass 10% shrub 10% soil, 4. FC = 10%, 5. DH = 10m+. Other -river veg, grass/reeds,possible grassland with tree
TP24	C	1. PF - ENE, 2. DV - Shrub, 3. GC = 45% grass 15% shrub 40% soil, 4. FC = 10-15%, 5. DH = 2.0-3.0m. Other - some shrub /trees 5-10m
TP22	A	1. PF - NNW, 2. DV - Trees, 3. GC = 60% grass 30% shrub 10% soil, 4. FC = 50%, 5. DH = 10m+. Other - dense river veg, grass/reeds, understory 5m+
TP25	G	1. PF - S, 2. DV - Grass, 3. GC = 45% grass 10% shrub 45% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m,
TP26	A	1. PF - WNW, 2. DV - Trees, 3. GC = 50% grass 40% shrub 10% soil, 4. FC = 60%, 5. DH = 10m+. Other - dense river veg, grass/reeds, understory 5m+
TP27	G	1. PF - NE, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, rocky outcrops
TP28	O	PF - W, parkland
TP29	G	1. PF - NE, 2. DV - Grass, 3. GC = 45% grass 5% shrub 50% soil, 4. FC = 5%, 5. DH = 1.0m. Other - some shrub /trees 2-10m, rocky outcrops, same as TP27
TP30	B	1. PF - ENE, 2. DV - Trees, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 10%, 5. DH = 10m. Other - river bank veg, rock river, grass banks,tall trees
TP31	B	1. PF - SW, 2. DV - Trees, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 10%, 5. DH = 10m. Other - river bank veg, rock river, grass banks,tall trees
TP32	B	1. PF - NE, 2. DV - Trees, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 10%, 5. DH = 6-8m. Other - river bank veg, rock river, grass banks, scrub?
TP33	G	1. PF - NE, 2. DV - Grass, 3. GC = 65% grass 5% shrub 30% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 1.5-5m
TP34	D	1. PF - ESE, 2. DV - Scrub, 3. GC = 60% grass 20% shrub 20% soil, 4. FC = 15%, 5. DH = 5m
TP35	G	1. PF - NE, 2. DV - Grass, 3. GC = 45% grass 10% shrub 45% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, borderline shrubland
TP36	G	1. PF - NNW, 2. DV - Grass, 3. GC = 45% grass 10% shrub 45% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, borderline shrubland
TP37	G	1. PF - N, 2. DV - Grass, 3. GC = 45% grass 10% shrub 45% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, borderline shrubland
TP38	G	1. PF - NE, 2. DV - Grass, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, borderline shrubland
TP39	G	1. PF - E, 2. DV - Grass, 3. GC = 60% grass 10% shrub 30% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, borderline shrubland
TP40	D	1. PF - NE, 2. DV - Grass, 3. GC = 60% grass 20% shrub 20% soil, 4. FC = 15%, 5. DH = 5.0m. Other - sparse shrub/scrub 0.5-5m, shrubland

PPOINT_ID	VEG_CLASS	NOTES
TP41	G	1. PF - SSW, 2. DV - Grass, 3. GC = 50% grass 5% shrub 45% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m
TP42	G	1. PF - NE, 2. DV - Grass, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, borderline shrubland
TP43	C	1. PF - SE, 2. DV - Shrub, 3. GC = 60% grass 20% shrub 20% soil, 4. FC = 10%, 5. DH = 3.0m. Other - sparse shrub/scrub 3-5m
TP44	D	1. PF - W, 2. DV - Scrub, 3. GC = 70% grass 20% shrub 10% soil, 4. FC = 20-30%, 5. DH = ~7m. Other - possible woodland, some trees 5-10m
TP45	A	1. PF - N, 2. DV - Trees, 3. GC = 60% grass 30% shrub 10% soil, 4. FC = 30%, 5. DH = 7-8m. Other - dense river veg, understory 5m+, maybe scrub?
TP46	C	1. PF - S, 2. DV - Shrub, 3. GC = 40% grass 20% shrub 40% soil, 4. FC = 5%, 5. DH = 2.0m. Other - sparse shrub/scrub 3-5m, looks recently burned
TP47	C	1. PF - NNW, 2. DV - Shrub, 3. GC = 40% grass 20% shrub 40% soil, 4. FC = 5%, 5. DH = 2.0m. Other - sparse shrub/scrub 3-5m, looks recently burned
TP48	G	1. PF - NE, 2. DV - Grass, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m
TP49	A	1. PF - S, 2. DV - Trees, 3. GC = 70% grass 20% shrub 10% soil, 4. FC = 30%, 5. DH = 7-10m. Other - dense river veg, understory 5m+, maybe scrub
TP50	D	1. PF - NE, 2. DV - Scrub, 3. GC = 70% grass 20% shrub 10% soil, 4. FC = 10%, 5. DH = 3-5m. Other - possible shrubland, some trees 5-10m
TP51	G	1. PF - NE, 2. DV - Grass, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m
TP52	G	1. PF - ENE, 2. DV - Grass, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m
TP53	G	1. PF - NNE, 2. DV - Grass, 3. GC = 45% grass 10% shrub 40% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub 1.5-4m occasional tree 10-15m
TP54	C	1. PF - N, 2. DV - Shrub, 3. GC = 60% grass 15% shrub 30% soil, 4. FC = 5%, 5. DH = 2-3m. Other - sparse shrub/scrub 3-5m, grassland?
TP55	C	1. PF - N, 2. DV - Shrub, 3. GC = 60% grass 15% shrub 30% soil, 4. FC = 5%, 5. DH = 2-3m. Other - sparse shrub/scrub 3-5m, grassland?
TP56	G	Burned
TP58	G	1. PF - SW, 2. DV - Shrub, 3. GC = 50% grass 15% shrub 35% soil, 4. FC = 10%, 5. DH = 1.5-2m. Other - sparse scrub 2-4m occasional tree 10m
TP59	G	1. PF - E, 2. DV - Trees, 3. GC = 50% grass 5% shrub 45% soil, 4. FC = 10%, 5. DH = 10-15m. Other - typical street side trees
TP60	D	1. PF - S, 2. DV - Scrub, 3. GC = 80% grass 10% shrub 10% soil, 4. FC = 30%, 5. DH = 7m. Small patch of forest, further south scrub
TP62	G	1. PF - SE, 2. DV - Grass, 3. GC = 80% grass 5% shrub 15% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m
TP63	G	1. PF - S, 2. DV - Grass, 3. GC = 80% grass 5% shrub 15% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub/scrub 0.5-5m, some trees 5-10m
TP64	B	1. PF - N, 2. DV - Trees, 3. GC = 70% grass 10% shrub 20% soil, 4. FC = 10%, 5. DH = 15m. Other - river woodland, sparse understory, mostly grass
TP65	G	PF - ENE, Parkland, cleared, grass
TP66	B	1. PF - E, 2. DV - Trees, 3. GC = 60% grass 10% shrub 30% soil, 4. FC = 10%, 5. DH = 10m
TP67	G	1. PF - E, 2. DV - Grass, 3. GC = 40% grass 10% shrub 40% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub 1.5-4m occasional tree 10-15m
TP68	G	1. PF - NNE, 2. DV - Grass, 3. GC = 40% grass 10% shrub 40% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub 1.5-4m occasional tree 10-15m
TP69	G	1. PF - W, 2. DV - Grass, 3. GC = 40% grass 10% shrub 40% soil, 4. FC = 5%, 5. DH = 1.0m. Other - sparse shrub 1.5-4m occasional tree 10-15m

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Appendix C – Bushfire protection criteria

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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

The intent may be achieved where:

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 Department of Fire and Emergency Services and the decision-maker.

ACCEPTABLE SOLUTIONS

To achieve compliance with this Element using an acceptable solution, the following acceptable solution (A1.1) must be met

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.

EXPLANATORY NOTES

Land is most suitable for land use intensification where hazard levels are low. Where there is an extreme bushfire hazard or requirement for use of BAL-40 or BAL-FZ construction standards, the land is not considered suitable for development unless it meets the definition of minor or unavoidable development.

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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

The intent may be achieved where:

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. That it incorporates a defensible 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.

ACCEPTABLE SOLUTIONS

To achieve compliance with this Element the following acceptable solution must be met.

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 Schedule 1).

ELEMENT 2: SITING AND DESIGN OF DEVELOPMENT

EXPLANATORY NOTES

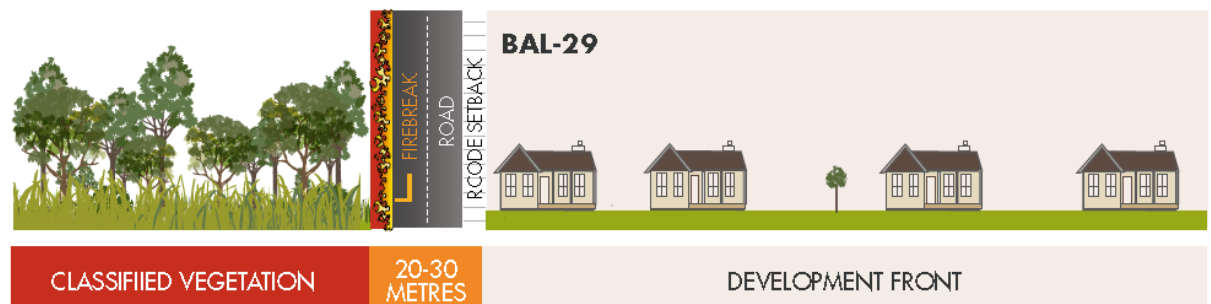
Figure 13: Separation distance required where no additional construction standards are proposed

In the absence of additional construction standards a minimum separation distance of 100 metres between buildings and the hazard must be provided in order to protect them from burning debris, radiant heat and direct flame contact



Figure 14: A reduced separation distance may necessitate increased construction standards

It may be possible to reduce the minimum distances, for example by increasing the construction standard of the building – in this example the building would need to be constructed to BAL-29



ELEMENT 3: VEHICULAR ACCESS

Intent: To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event.

PERFORMANCE PRINCIPLE

The intent may be achieved where:

P3

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 easily and safely at all times.

ACCEPTABLE SOLUTIONS

To achieve the intent, all applicable 'acceptable solutions' must be addressed.

A3.1 Two access routes

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.

A3.2 Public road

A public road is to meet the requirements in Table 4, Column 1.

A3.3 Cul-de-sac (including a dead-end road)

A cul-de-sac and/or a dead end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), the following requirements are to be achieved:

- Requirements in Table 4, Column 2;
- Maximum length: 200 metres (if public emergency access is provided between cul-de-sac heads maximum length can be increased to 600 metres provided no more than eight lots are serviced and the emergency access way is no more than 600 metres); and
- Turn-around area requirements, including a minimum 17.5 metre diameter head.

A3.4 Battle-axe

Battle-axe access leg should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) all of the following requirements are to be achieved:

- Requirements in Table 4, Column 3;
- Maximum length: 600 metres; and
- Minimum width: six metres.



ELEMENT 3: VEHICULAR ACCESS

PERFORMANCE PRINCIPLE

ACCEPTABLE SOLUTIONS

A3.5 Private driveway longer than 50 metres

A private driveway is to meet all of the following requirements:

- Requirements in Table 4, Column 3;
- Required where a house site is more than 50 metres from a public road;
- Passing bays: every 200 metres with a minimum length of 20 metres and a minimum width of two metres (i.e. the combined width of the passing bay and constructed private driveway to be a minimum six metres);
- Turn-around areas designed to accommodate type 3.4 fire appliances and to enable them to turn around safely every 500 metres (i.e. kerb to kerb 17.5 metres) and within 50 metres of a house; and
- Any bridges or culverts are able to support a minimum weight capacity of 15 tonnes.
- All-weather surface (i.e. compacted gravel, limestone or sealed).

A3.6 Emergency access way

An access way that does not provide through access to a public road is to be avoided in bushfire prone areas. Where no alternative exists (this will need to be demonstrated by the proponent), an emergency access way is to be provided as an alternative link to a public road during emergencies. An emergency access way is to meet all of the following requirements:

- Requirements in Table 4, Column 4;
- No further than 600 metres from a public road;
- Provided as right of way or public access easement in gross to ensure accessibility to the public and fire services during an emergency; and
- Must be signposted.

A3.7 Fire service access routes (perimeter roads)

Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for fire-fighting purposes. Fire service access routes are to meet the following requirements:

- Requirements Table 4, Column 5;
- Provided as right of ways or public access easements in gross to ensure accessibility to the public and fire services during an emergency;
- Surface: all-weather (i.e. compacted gravel, limestone or sealed)
- Dead end roads are not permitted;
- Turn-around areas designed to accommodate type 3.4 appliances and to enable them to turn around safely every 500 metres (i.e. kerb to kerb 17.5 metres);
- No further than 600 metres from a public road;
- Allow for two-way traffic and;
- Must be signposted.

ELEMENT 3: VEHICULAR ACCESS

PERFORMANCE PRINCIPLE

ACCEPTABLE SOLUTIONS

A3.8 Firebreak width

Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government.

Table 4: Vehicular access technical requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
*Refer to E3.2 Public roads: Trafficable surface					

ELEMENT 4: WATER

Intent: To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.

PERFORMANCE PRINCIPLE

The intent may be achieved where:

P4

The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for fire fighting purposes.

ACCEPTABLE SOLUTIONS

To achieve the intent, all applicable 'acceptable solutions' must be addressed.

A4.1 Reticulated areas

The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.

A4.2 Non-reticulated areas

Water tanks for fire fighting purposes with a hydrant or standpipe are provided and meet the following requirements:

- Volume: minimum 50,000 litres per tank;
- Ratio of tanks to lots: minimum one tank per 25 lots (or part thereof);
- Tank location: no more than two kilometres to the further most house site within the residential development to allow a 2.4 fire appliance to achieve a 20 minute turn-around time at legal road speeds;
- Hardstand and turn-around areas suitable for a type 3.4 fire appliance (i.e. kerb to kerb 17.5 metres) are provided within three metres of each water tank; and
- Water tanks and associated facilities are vested in the relevant local government.

A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)

- Single lots above 500 square metres need a dedicated static water supply on the lot that has the effective capacity of 10,000 litres.

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft A	C Thompson T Hibberd	P De Mar		N Hanrahan		9.8.17

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