

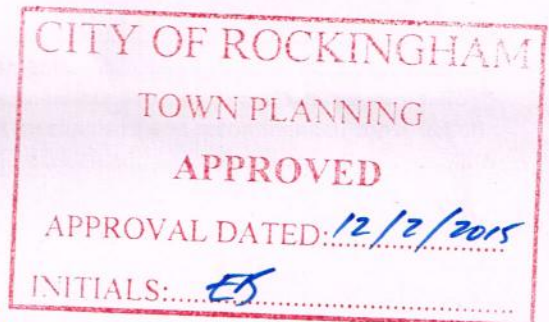
Bushfire Safety

C O N S U L T I N G

Bushfire Attack Level (BAL) Assessment Report

Prepared for: Gold Right Pty Ltd

*Site: West Karnup Subdivision Stage 2A
Portion of Lot 806 Mandurah Road, Karnup
City of Rockingham
Western Australia*



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Report Version	Revision Number	Purpose	BSC Author	Submitted to Client	
				Form	Date
Draft	Rev 0.1	Internal Review	RC		24/01/2015
Final	2.0	Client Submission	RC	email	29/01/2015
Final	3.0	Submission to CoR	RC	email	11/02/2015

Disclaimer:

This report has been prepared in good faith and is derived from sources believed to be reliable and accurate at the time of publication. Nevertheless, this publication is distributed on the terms and understanding that the author is not responsible for results of any actions taken based on information in this publication or for any error in or omission from this publication.

Notwithstanding the precautions adopted in this report, it should always be remembered that bushfires burn under a wide range of conditions. An element of risk, no matter how small always remains. The objective of the standard (AS 3959:2009) is 'to prescribe particular construction details for buildings to reduce the risk of ignition from a bushfire while the front passes' (Standards Australia, 2009). Building to the standard (AS 3959:2009) does not guarantee a building will survive a bushfire.

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EXECUTIVE SUMMARY

This Report provides an assessment of the Bushfire Attack Level (BAL) in accordance with AS 3959:2009 *Construction of Buildings in Bushfire Prone Areas* for West Karnup Subdivision Stage 2A in the City of Rockingham.

Twenty six residential lots on the perimeter of the development stage are exposed to a Bushfire Attack Level (BAL) rating of BAL-12.5. The proposed dwellings on these lots are predicted to be exposed primarily to ember attack and this risk can be partially mitigated by constructing the dwellings to sections 3 and 5 in the Australian Standard (AS 3959-2009 *Construction of buildings in bushfire prone areas*).

If there is a bushfire within or near the site, constructing the identified dwellings to the relevant section in AS 3959-2009 will reduce the risk of ignition to the buildings.

The BAL depicted within this report and mapping have been determined by an assessment of the site and the surrounding 100 metres in January 2015. It should be noted that conditions may change in the future and over time and this may result in a different BAL rating.

1 INTRODUCTION

Bushfire Safety Consulting Pty Ltd has been engaged by Gold Right Pty Ltd to undertake a Bushfire Attack Level (BAL) assessment within the Subdivision stage 2A. This assessment has been undertaken to satisfy the developer's responsibilities for subdivision within the LSP area as outlined in the endorsed Fire Management Plan (FMP) for the broader West Karnup LSP Area (attached as Attachment 1). The BAL assessment identifies the level of predicted exposure for proposed lots and the subsequent recommended construction standards for future dwellings. Exposed lots will require a Section 70A Notification on titles informing purchasers of the responsibilities of the FMP and of any bushfire construction standards.

Subdivision stage 2A is predominantly a residential development and also includes four commercial lots. Future development stages approved by the WAPC will each be provided with a separate BAL assessment before the creation of titles to ensure an accurate representation of the bushfire threat.

Subdivision Stage 2A is hereafter referred to as the 'site'. Table 1 specifies the site details and the site plan is attached in Attachment 1.

Table 1: Site Details

Locality	City of Rockingham
Address	West Karnup Subdivision Stage 2A (portion of Lot 806 Mandurah Road, Karnup)
Fire Management Plan	Bushfire Safety Consulting (2013)
Endorsed Local Structure Plan	West Karnup LSP
Zoning	Development
Forest Danger Index	80
Site Inspection	January, 2015

This BAL report assesses the application of AS 3959-2009 *Construction of Buildings in Bushfire Prone Areas* and relevant part of Appendix 1 of *Planning for Bushfire Protection Guidelines – Edition 2* (WAPC et al., 2010).

The proposal is to create 47 residential lots and 4 mixed use lots in the development stage.

2 METHODOLOGY AND ASSUMPTIONS

The Australian Standard for assessing the BAL and providing the detailed requirements for construction includes the version titled AS 3959-2009/Amendment 3-2011 *Construction of Buildings in Bushfire Prone Areas* (Standards Australia, 2011).

In addition, the WA method for determining the BAL, found in Appendix 1 of *Planning for Bushfire Protection Guidelines – Edition 2* (WAPC et al., 2010) is consistent with the methodology in AS 3959-2009.

AS 3959-2009 has six categories of Bushfire Attack Level, namely BAL-LOW, BAL-12.5, BAL19, BAL-29, BAL-40 and BAL-FZ. These categories are based on heat flux exposure thresholds. The method for determining the BAL involves a site assessment of vegetation and local topography. The assumed Fire Danger Index (FDI) for Western Australia is 80. The BAL identifies the appropriate construction standard that applies as a minimum standard in AS 3959-2009.

It is a legal requirement of each lot owner to comply with section 33 of the *Bush Fires Act 1958*. Specific responsibilities under this legislation are outlined in the City of Rockingham Fire Control Notice which can be downloaded at:

http://www.rockingham.wa.gov.au/getattachment/Residents/Home-safety-and-security/Fire-safety/CD_IS_FIRECONTROLNOTICE2013_2014.pdf.aspx

This assessment is undertaken on the basis that each lot owner's legal responsibilities will be achieved and maintained in perpetuity.

The BAL assessment involves an assessment of the vegetation, setback distance to classified vegetation and effective slope.

2.1 Vegetation Assessment

Vegetation survey and mapping of the site has been undertaken as follows:

- Aerial photographic interpretation to identify broad vegetation types and boundaries
- Field assessment to confirm vegetation classes, condition, fuel structure and land-use.

2.2 Setback Distance to Classified Vegetation

The horizontal setback distance assessment has been undertaken as follows:

- Aerial photographic interpretation and analysis of scaled digital map
- Field assessment and setback measurement using a measuring wheel.

2.3 Effective Slope Assessment

The effective slope assessment has been undertaken as follows:

- Aerial photographic interpretation and analysis of digital contour maps
- Field assessment and slope measurements using a clinometer.

3 SITE ASSESSMENT

A site assessment of the vegetation, setback distance and slope was undertaken in accordance with *Planning for Bushfire Protection Guidelines – Edition 2* (WAPC et al., 2010) and AS 3959-2009. The assessment criteria outcomes are summarised in Appendix A.

3.1 Vegetation Assessment

The site is entirely cleared of vegetation, all of the original vegetation has been removed during initial earthworks for the residential development. The site survey undertaken for this assessment identified two vegetation classes located south of the site in the bushforever reserve which qualify as classified vegetation according to AS3959-2009.

The dominant vegetation class south of the site is shrubland, this is composed of typical coastal heath species and grasses with an average height of 1 metre (Figure 1). The grasses indicate the shrubland is degraded.

Two small areas of scrub vegetation occur to the south-east and south-west of the site. This vegetation contains acacia species and the canopy heights on average exceed 2 metres (Figure 2).

The remaining area east, north and west of the site contain the cleared development area and mineral earth (sand) which posed no threat to the site.

Refer to Table 2 and Appendix A for details and summary of the vegetation assessment.



Figure 1: Shrubland is the dominant vegetation south of the site



Figure 2: Scrub occurs in isolated areas south of the site

3.2 Setback Distance

The shrubland vegetation immediately south of the site is setback 25 – 100 metres from the residential lots. The scrub is located further from the lots and is setback 43-100 metres from the site. Refer to Table 2 for summary of setback distance assessment.

3.3 Effective Slope Assessment

The shrubland and scrub vegetation south of the site has no effective slope. Refer to Table 2 for summary of effective slope assessment.

Table 2: Vegetation, effective slope and setback distance assessment

Direction from Site	Vegetation Classification	Effective Slope	Setback Distance
North	Mineral Earth - Low Threat Vegetation ¹	N/A	N/A
East	Mineral Earth - Low Threat Vegetation ¹	N/A	N/A
West	Mineral Earth - Low Threat Vegetation ¹	N/A	N/A
South	Shrubland	Flat	25-100 metres
South	Scrub	Flat	43-100 metres

Note: 1. Section 2.2.3.2 of AS 3959-2009 classifies Low Threat Vegetation where the vegetation is one or a combination of the following:

- a) Vegetation of any type that is more than 100 m from the site;
- b) Single areas of vegetation less than 1 ha in area and now within 100m of other areas of vegetation being classified;
- c) Multiple areas of vegetation less than 0.25 ha and not within 20 m of the site, or each other;
- d) Strips of vegetation less than 20 m in width (measured perpendicular to the elevation exposed to the strip of vegetation) regardless of length and not within 20 m of the site or each other, or other areas of vegetation being classified;
- e) Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops; and
- f) Low threat vegetation, including grassland managed in a minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated gardens, commercial nurseries, nature strips and windbreaks.

4 DETERMINATION OF BUSHFIRE ATTACK LEVEL ASSESSMENT

The results from this methodology were used to calculate the BAL rating for the proposed lots using Table 2.4.3 in AS 3959-2009. The results of this BAL Assessment are outlined in Table 3.

Table 3: Bushfire Attack Level assessment for the site

Setback Distance (m)	Classified Vegetation	Effective Slope (°)	BAL Rating
25-100 metres	Shrubland	Flat	BAL-12.5
43-100 metres	Scrub	Flat	BAL-12.5
> 100 metres	All vegetation classes	N/A	BAL-LOW

5 CONCLUSION, SHIELDING AND RECOMMENDATION S

Twenty six residential lots on the southern perimeter of the site are exposed to a Bushfire Attack Level (BAL) of BAL-12.5 as spatially shown in Appendix A.

The construction elements on future buildings located on these lots are expected to be exposed to ember attack and a radiant heat flux of not greater than 12.5 kW/m². The recommended construction section in (AS 3959-2009) Construction of Buildings in Bushfire Prone Areas is Section 3 and 5 (Table 2).

The proposed buildings are not shielded from the predicted ember attack because embers cannot be shielded by other structures, they blow on the wind unlike radiant heat which travels in straight lines.

These exposed lots (as highlighted in Appendix B) will require a section 70A Notification on title informing purchasers of the responsibilities of the FMP and the bushfire construction standards.

Lots >100 metres from the classified vegetation are assessed as BAL-LOW and do not require notifications on title.

Table 4: Heat flux exposure thresholds, predicted bushfire attack mechanisms and recommended construction standard

BAL	Heat flux thresholds	Description of predicted bushfire attack and levels of exposure	Recommended Construction Section in AS 3959-2009
BAL-12.5	<12.5KW/m ²	Ember attack	3 and 5

6 REFERENCES

Bushfire Safety Consulting (2013) Fire Management Plan Lots 3, 805 & 806 Mandurah Road, Karnup

City of Rockingham Fire Control Notice (downloadable at:
http://www.rockingham.wa.gov.au/getattachment/Residents/Home-safety-and-security/Fire-safety/CD_IS_FIRECONTROLNOTICE2014_2015.pdf.aspx)

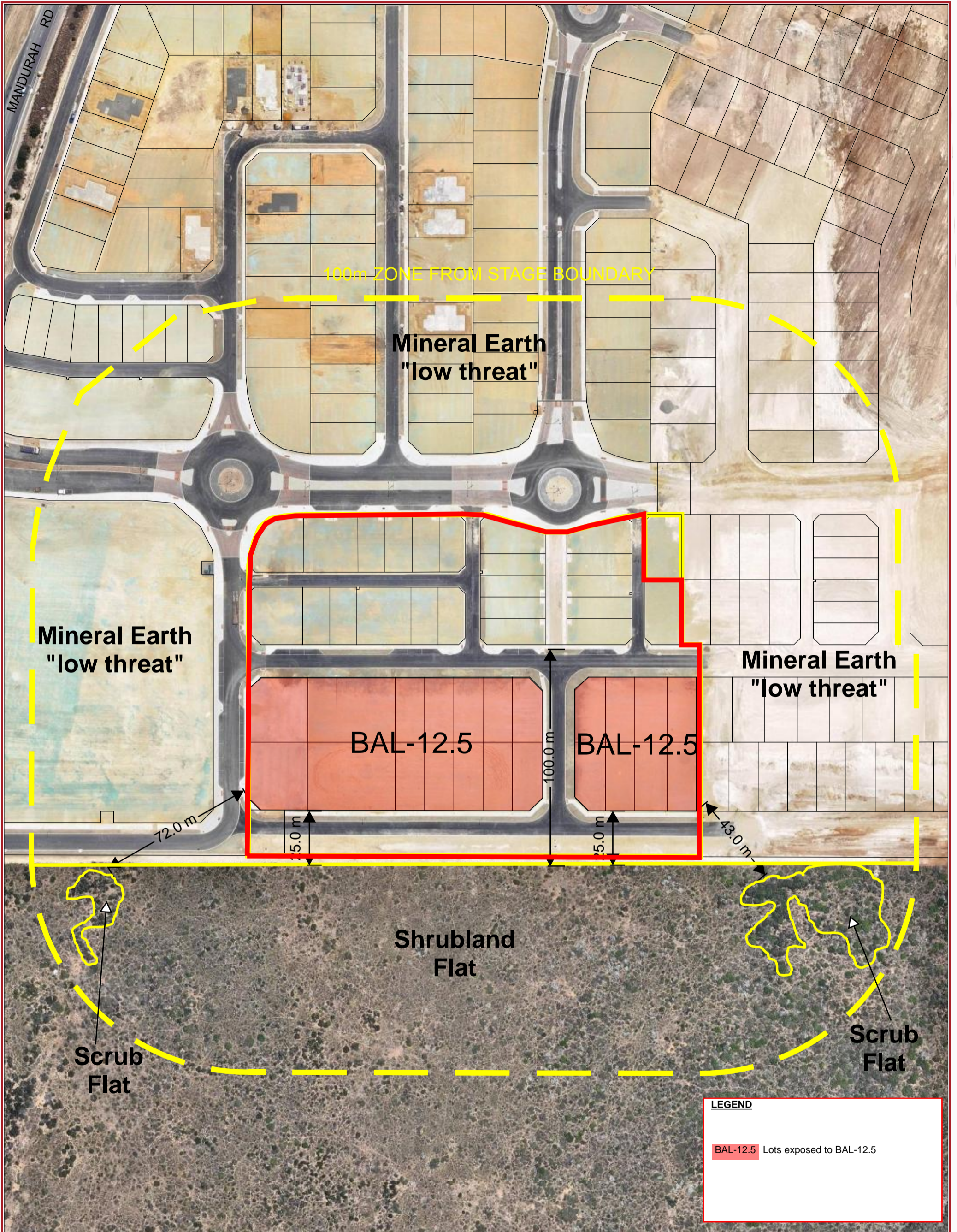
Standards Australia. (2009). AS 3959-2009 *Construction of buildings in bushfire-prone areas*.

Standards Australia. (2011). AS 3959-2009/Amendment 3-2011 *Construction of buildings in bushfire-prone areas*.

Western Australian Planning Commission (WAPC), FESA and Department of Planning and Infrastructure. (2010). *Planning for Bush Fire Protection Guidelines - Edition 2*. Western Australian Planning Commission, Perth.



APPENDICES



Appendix A
BAL Assessment Criteria & Outcome


LOTS 805 & 806 MANDURAH ROAD
 KARNUP (STAGE 2A)
 City of Rockingham


LEGEND

SUBJECT LAND..... 

SOURCE:
 PHOTOGRAPHY FROM NEARMAP

PREPARED FOR:
 GOLD RIGHT PTY LTD

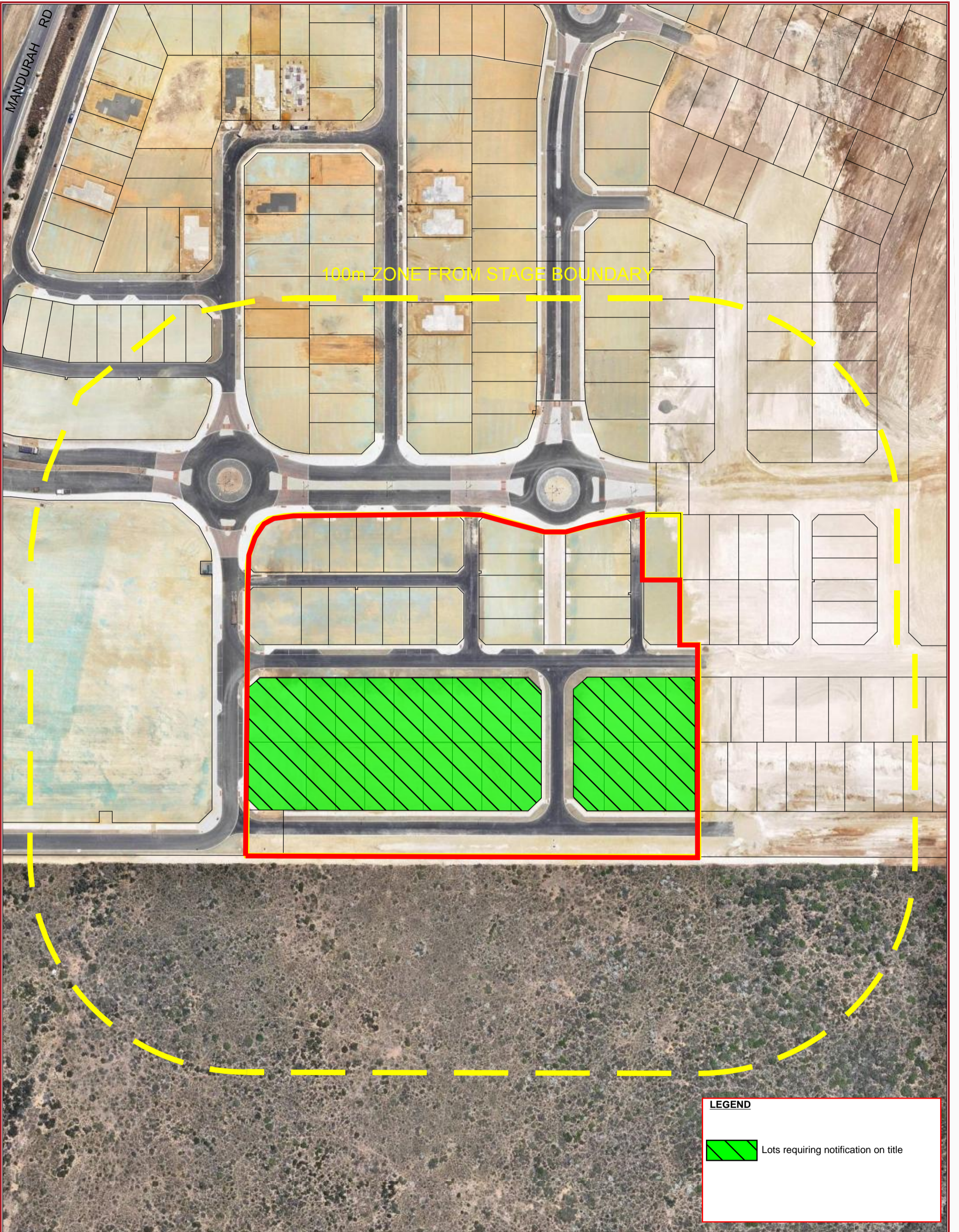

 NORTH


 NOT TO SCALE @ A3
 DATE: JANUARY 2015
 Base mapping supplied by
 Development Planning Strategies


Bushfire Safety
 CONSULTING

BUSHFIRE SAFETY CONSULTING

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LEGEND

 Lots requiring notification on title

Appendix B
Lots Requiring Notification on Title

LOTS 805 & 806 MANDURAH ROAD
 KARNUP (STAGE 2A)
 City of Rockingham

LEGEND

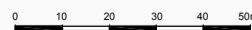
SUBJECT LAND..... 

SOURCE:
 PHOTOGRAPHY FROM NEARMAP

PREPARED FOR:
 GOLD RIGHT PTY LTD



NORTH



NOT TO SCALE @ A3
 DATE: JANUARY 2015
 Base mapping supplied by
 Development Planning Strategies

Bushfire Safety
 CONSULTING


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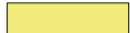







ATTACHMENTS


LEGEND :




-  Subject Site

- ZONES**
-  Residential 25
-  Residential 30
-  Residential 40
-  Residential 60
-  Commercial

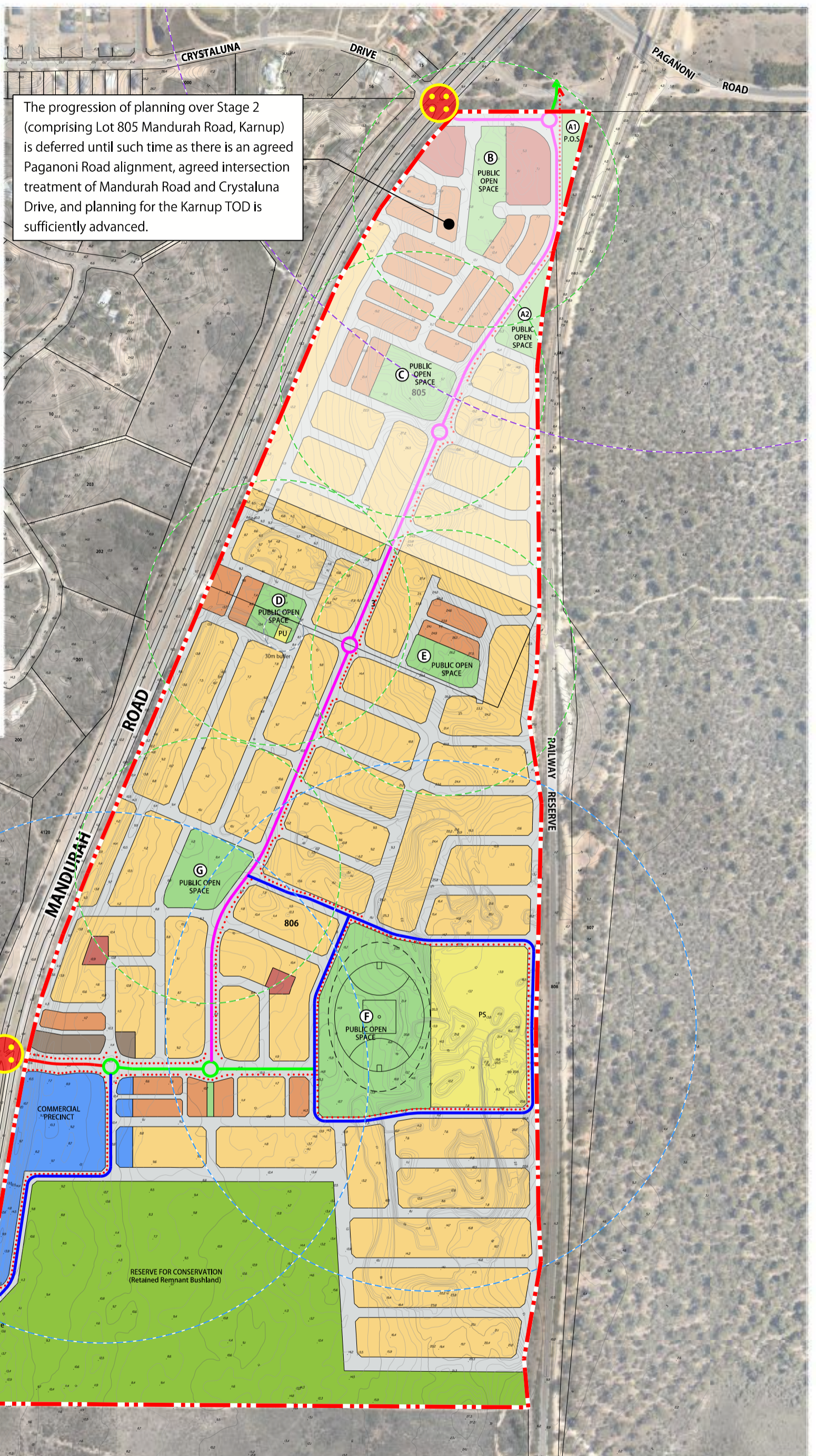
- RESERVES**
-  Road Reserve
-  Public Open Space/Ref Number
-  Reserve for Conservation
-  Public Purposes
- PS - Primary School
- PU - Public Utilities

- ROAD HIERARCHY**
-  Integrator B
-  Neighbourhood Connector A
-  Neighbourhood Connector B
-  Access Street B
-  Light Controlled Intersection

- PATH NETWORK**
-  Dual Use Paths

- WALKABLE CATCHMENTS**
-  200m POS walkable catchment
-  400m Major Community Node walkable catchment
-  800m TOD walkable catchment

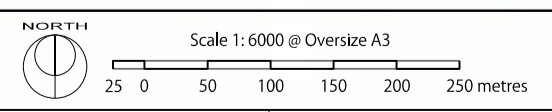
The progression of planning over Stage 2 (comprising Lot 805 Mandurah Road, Karnup) is deferred until such time as there is an agreed Paganoni Road alignment, agreed intersection treatment of Mandurah Road and Crystaluna Drive, and planning for the Karnup TOD is sufficiently advanced.



PLAN 1 - Local Structure Plan

Lots 3, 805 and 806 Mandurah Road, KARNUP

for: Gold Right Pty Ltd.



COMPILED: DPS, JDSI, EMERGE	DRAWN BY: NM/LW
DATE: 26/6/2012	REVISED: 11/03/2014
GRID: PCG 94	DATUM: AHD
DRAWING NUMBER: GOGKA-2-001F	JOB CODE: GOGKALSP
FILE ID: M:\GOGKA\BASE\STRUCTURE PLANS\GOGKA-2-001f.dgn	



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