



# LOTS 401 & 9001 HAMPTON ROAD PINJARRA, STRUCTURE PLAN

PINJARRA



**ROWE**GROUP



## DOCUMENT CONTROL

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1	8633_17apr01R_rd	Reyne Dial	George Hajigabriel	6/04/2017

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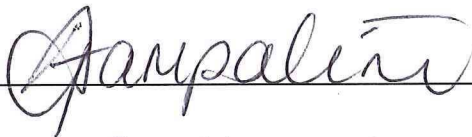
This structure plan is prepared under the provisions of the Shire of Murray  
Town Planning Scheme No.4

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY  
RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION  
ON: 9 May 2017

Signed for and on behalf of the Western Australian Planning Commission



an officer of the Commission duly authorised by the Commission pursuant to  
Section 16 of *the Planning and Development Act 2005* for that purpose, in the  
presence of:



Witness

9 May 2017

Date

Date of Expiry: 9 May 2027





## TABLE OF AMENDMENTS

Amendment No.	Summary of Amendment	Amendment Type	Date approved by WAPC





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## FIGURES

1. Regional Location
2. Locality Plan
3. Aerial Photography / Site Plan
4. Peel Region Scheme
5. Shire of Murray Town Planning Scheme No. 4







## TECHNICAL APPENDICES

Appendix Number	Document Title	Nature of Document	Referral/Approval Agency	Summary of Document Modifications
1.	Structure Plan	Approval Required	Shire of Murray	
2.	Certificates of Title	Supporting document only	-	
3.	Local Water Management Strategy	Approval Required	Shire of Murray / Department of Water	
4.	Bushfire Management Plan	Approval Required	Department of Fire and Emergency Services	





# 01

## Introduction

Rowe Group acts on behalf of the contracted purchaser of Lot 401 and 9001 Hampton Road, Pinjarra (the 'subject site'). This document has been compiled to satisfy the requirements of the Shire of Murray Town Planning Scheme No. 4 ('TPS 4') as they relate to the "Residential Development" zone included under Section 6.5 of Town Planning Scheme No. 4.

In accordance with the provisions of TPS and the Planning and Development (Local Planning Schemes) Regulations 2015, it is required that prior to the subdivision and development of land, a structure plan must be adopted by the Western Australian Planning Commission (WAPC) upon recommendation of the Shire of Murray.

A copy of the structure plan for Lot 401 and 9001 Hampton Road, Pinjarra is contained in Appendix 1 of this documentation.

The Structure Plan forms a precursor to the subdivision and development of land and is intended to demonstrate the fundamental principles pertaining to the subdivision design proposed for the subject site, and show relevant linkages with adjoining land to the south in terms of road access, lot layout and servicing provision.

### 1.1 Consultant Team

The Consultant Team appointed by the proponent who has supplied specialist planning, engineering and environmental input include;

- ▲ Rowe Group – Town Planning and Urban Design;
- ▲ Dennis Price and Miller – Civil Engineering Consultants; and
- ▲ Ecoscape Australia Pty Ltd – Environmental Consultants.



# 02

## Site Description / Analysis

### 2.1 Regional Location

Lot 401 and 9001 Hampton Road, Pinjarra are located approximately 80 kilometres south of the Perth Central Area in the locality of Pinjarra. The land is situated 18 kilometres south-east of Mandurah.

Refer to Figure 1 – Regional Location.

### 2.2 Local Location

The subject site is bounded by existing residential allotments to the north and east. To the south the land is predominantly vacant with isolated residential dwellings with both Rural and Public Purpose zoned land situated on the western side of Hampton Road. The subject site has direct road frontage to Hampton Road and abuts an existing reserve for recreation in an “L shaped” arrangement of Humphry Street and Cornish Way in the north-east corner.

An existing residential dwelling has been constructed in the north-west corner of Lot 401 with a separate garage / outbuilding structure. Hampton Road, which borders the subject site, is classified as a district distributor in the Pinjarra Road hierarchy and will serve the requirements of the additional residents who will reside on the allotments created through the development of the subject site.

Refer to Figure 2 – Local Location Plan.

### 2.3 Legal and Cadastral Information

The structure plan comprises two (2) freehold titles, being:

- ▲ Lot 401 on Plan 58906 Certificate of Title Volume: 2687; Folio: 93; and
- ▲ Lot 9001 on Plan 58906 Certificate of Title Volume: 2687; Folio: 97.

The subject site comprises a total land area of 2.0429 hectares, with a frontage of 100.5m to Hampton Road.

Refer Figure 3 – Site Plan and Appendix 2 – Certificate of Title.



# 03

## Town Planning Considerations

### 3.1 Zoning and Reservations

#### 3.1.1 Peel Region Scheme

The subject site is zoned “Urban” under the provisions of the Peel Region Scheme (‘PRS’).

Refer to Figure 4 – Peel Region Scheme Map.

#### 3.1.2 Shire of Murray Town Planning Scheme No. 4

The subject site is zoned “Residential Development” zone under the provisions of TPS 4. In accordance with the PRS, the zoning of land under a local authority Town Planning Scheme is required to be consistent with its zoning under the PRS.

The “Residential Development” zone within TPS 4 does not have a specific Residential Density Code (R Code) assigned to the associated landholdings. It is a requirement of TPS 4 that a Structure Plan is prepared over the subject site prior to development / subdivision being permitted. The residential density is dictated through the Structure Plan.

The Structure Plan is required to be prepared in accordance with the provisions of TPS 4 and must contain information specified in Clause 6.5.3 of TPS 4. This information includes:

- ▲ Detailed subdivision design;
- ▲ Proposed infrastructure;
- ▲ Allocation of residential densities;
- ▲ The approximate location of recreation and open space areas proposed;
- ▲ The layout of comprehensive drainage, both land and stormwater; and
- ▲ Such other information deemed relevant by Council with regard to the future development of the subject site.

Refer to Figure 5 – Shire of Murray Town Planning Scheme No. 4 Zoning.

### 3.2 Existing Services


#### 3.2.1 Sewer

Existing sewer lines are located within the subject site along the northern and eastern boundaries of Lot 401. These lines are capable of servicing the proposed subdivision but easements would be required at the rear of all proposed lots situated over this sewer.

#### 3.2.2 Water

An existing 100mm diameter water main is located within the eastern verge of Hampton Road that can service the development.





### **3.2.3 Power, Telstra and Gas**

A site inspection identified existing overhead power lines within the eastern verge of Hampton Road. The replacement of this line underground would in any case be a probable requirement of subdivision and would also be desirable from an aesthetic and marketing perspective.

Existing Alinta gas services and Telstra cables are located near to the subject land and would be extended to serve the new lots.



# 04

## Environmental Considerations

### 4.1 Statement of Planning Policy 2.1 – Peel – Harvey Coastal Plain Catchment

The subject site is located within the Peel-Harvey Coastal Plain Catchment, identified by Statement of Planning Policy No. 2.1. Statement of Planning Policy No. 2.1 was introduced as a measure to protect the Peel-Harvey Estuary from excessive nutrient growth and overall degradation caused by over clearing and inappropriate use of surrounding land within the Estuary Catchment.

The subject site is located within the catchment area and in this regard, development on the land must meet prescribed criteria before Development Concept Plans may be approved. Some of the relevant criteria include:

- ▲ Subdivision proposals to make provision for a drainage system which maximises the consumption and retention of drainage on site;
- ▲ A moratorium on the clearing of existing vegetation; and
- ▲ Connection to a reticulated sewerage system.

Any proposed development needs to take into account and comply with the provisions of Statement of Planning Policy 2.1. More detailed information on how the proposed development has addressed the above criteria is included below.

### 4.2 Floodplain, Groundwater and Earthworks

The 100 year average recurrence interval ('ARI') flood mapping provided by the Department of Environment and Conservation ('DEC') indicated that the subject land is outside the flood prone areas as determined by the Murray River Flood Study. However, the flood level for the Murray River adjacent to the site is given as 11.13m Australian Height Datum ('AHD'), whereas contour information for the site indicates the current site levels are at approximately 10.5 to 11.0m AHD.

We have queried this anomaly with the DEC that has advised that the subject site is within a local drainage gully and thus floodwaters could spread through this general area. We have described this as the flood possibly "leaking" through the development. This is not to say that the land is directly affected by the forecast flood levels but simply that it will be necessary that any "leakage" is safely directed along the roads and past all houses by slightly elevating all lots above the road pavements.

The site earthworks will therefore be designed to ensure that all lots are about 0.25m above the road and for the road to be graded to direct any excess runoff to Hampton Road.

### 4.3 Acid Sulphate Soils

The Western Australian Planning Commission Planning Bulletin No 64 on Acid Sulphate Soils indicates that there is a moderate to low risk of either passive or active acid sulphate soils on the site at a depth greater than 3m. An onsite acid sulphate soils investigation would need to be undertaken to determine the actual extent of acid sulphate soils on the site. If the site is filled as described above and deep excavation works for sewer and drainage lines are undertaken during the summer months, then the extent of acid sulphate soil and groundwater treatment works required for the site should be reduced.



## 4.4 Vegetation Assessment

A vegetation assessment was undertaken by Landform Research in February 2006, who were commissioned to examine the various vegetation types existing on site. The results of the survey indicated that the site is dominated by one vegetated type namely *Corymbia calophylla*, *Eucalyptus marginata*, *Allocasuarina fraseriana* over a *Restionaceae* ground cover with a poorly developed shrub layer. This vegetation type has been identified as being part of the Bassendean Complex – central and south. While the survey was undertaken in accordance with the Environmental Protection Authority (2004) Guidance Statement No 51: Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in WA, it did not include a spring survey. The report highlighted that the site contained diverse flora and vegetation in good condition.

A site meeting was also held with representatives from the Department of Environment ('DoE') and the Environmental Protection Authority Service Unit in mid April 2006 arising from advice received from Department of Environment on another Residential development site (Lots 38 and 39 Hampton Road) north of the subject land. One suggestion at the meeting was to examine the potential to offset the impact of urban development on the vegetation through relocation of better vegetation through topsoil transfer, direct seeding and ongoing management to enhance degraded areas of the State Government vested land immediately to the west of Hampton Road. This land is vested under the care and control of CALM (now the Department for Environment and Conservation ['DEC']) and Aboriginal Lands Trust and an opportunity exists to consolidate the conservation values of the area via the abovementioned management approach.

This compromise solution is seen as representing a logical and common sense approach to addressing vegetation protection instead of trying to isolate smaller pockets of vegetation which would lead to problems in maintaining and managing separate remnant parcels of vegetation. Ecoscape also intend to carry out a spring flora survey and Threatened Ecological Community ('TEC') analysis, to be conducted in accordance with EPA Guidance No 51. The Environmental Consultant is to liaise with DEC, as the key agency for biodiversity conservation, for guidance on establishing the significance of the vegetation on site and reporting with respect to species of significance under the relevant legislation and EPA Guidance Statements.

## 4.5 Stormwater Drainage Strategy


In general, the design philosophy adopted is that all runoff from road reserves is to be collected, connected to the Shire drainage system and then discharged to an identified low point west of the site. Roof runoff can drain to conventional soakwells within individual lots. This philosophy assumes relatively permeable soils and average annual maximum groundwater level ('AAMGL') approximately 1.5m below lot pad levels. The geotechnical investigation has confirmed the validity of these assumptions.

The entire drainage system is to be designed utilising the "fail safe" philosophy. Thus, any peak rainfall events or a failure in the drainage system will result in peak runoff being restricted to the road reserves only and ultimately discharging to adjacent water bodies. Final levels within the development will be designed with this ultimate "fail safe" philosophy in mind.

The road and lot levels are to be designed to allow a safe flood route and maintain a minimum clearance of 250mm to all habitable floor levels and important infrastructure.

The drawing included in Appendix 3 highlights the specific stormwater drainage strategy proposed for the development, based on the design philosophy and criteria detailed above. Small swales are to be





constructed alongside the edge of Hampton Road and these are sized to detail the peak 10-year storm to comply with the Shire's requirements in this district.

It is proposed that runoff from the new road reserves be collected and transported via a traditional pit and pipe drainage system and discharged to an identified low point west of the site. It is also proposed that the existing open drains on Hampton Road will be backfilled and replaced with a piped system along the boundary of the Structure Plan area.

In order to promote on-site discharge of stormwater, it is proposed that side entry pits allow for soakage into the soil via aggregate filled "seepage holes" located in their bases.



## Structure Plan

### 5.1 Design Process

The proposed structure plan has been prepared to demonstrate the intended urban development pattern for the subject site. The structure plan has been prepared with due regard to the local planning framework and urban layout and development over the neighbouring landholdings. In this regard, Council recently considered a structure plan for landholdings to the south of the subject land, which incorporates Lot 50 McLarty Road and Lot 43 Hampton Road. These landholdings are also zoned "Residential Development" in Town Planning Scheme No. 4 and the proponents have submitted a revised Structure Plan which shows an indicative road layout over Lots 51 and 42 Hampton Road and Lot 51 McLarty Road. The road layout has been designed so that each of the Lots 401, 9001, 42 and 51 can be developed independently from Lots 43 and 50.

Council Officers have acknowledged that a further structure plan will be required for the future development of Lots 42 and 51. The layout of the proposed structure plan has therefore been undertaken in a manner that enables independent "stand alone" development of the subject site without reliance on any surrounding landholdings.

### 5.2 Proposed Density

The enclosed structure plan proposes a residential density of R20 which is consistent with the approach taken for landholdings further to the south and is consistent with the Western Australian Planning Commission's Liveable Neighbourhoods and Statement of Planning Policy (SPP No. 3 – Urban Growth and Settlement) which strongly suggests that R20 is the minimum density that should be applied to new urban areas or infill developments.

It is noted that most of the Pinjarra town site urban areas are presently coded R15 (minimum 580m<sup>2</sup> with an average of 666m<sup>2</sup>). However it is becoming evident that retirees and younger families are seeking smaller lots with less gardens to maintain and with a greater choice in housing design now available to fit these smaller lots, an increase in residential density to R20 is therefore considered to offer more lot size choice within the Pinjarra town site area, but still capable of providing a range of lots sizes from 450m<sup>2</sup> through to 600m<sup>2</sup> in area.


Based on preliminary designs, the structure plan provides for a yield of approximately 27 dwellings. On this basis, the structure plan achieves a density of approximately 18 dwellings per site hectare, and 13 dwellings per gross hectare. Whilst the structure plans falls slightly short of the density targets stipulated by both Liveable Neighbourhoods and Directions 2031, it is noted that the current market conditions for the Pinjarra locality require lot sizes slightly above the "market average" generally contemplated for the Perth Metropolitan area.

### 5.3 Public Open Space

The subject site has a total land area of 2.04 hectares and hence, generates the requirement for the provision of 2,040m<sup>2</sup> of Public Open Space in accordance with WAPC Policy DC 2.3 – Public Open Space in Residential Areas and Liveable Neighbourhoods.

The indicative subdivision layout plan considered by the Shire of Murray for the broader structure plan area to the south, identified an area of Public Open Space in the north-east corner of Lot 401 to be integrated in with the existing recreation reserve off Humphrey Street and Cornish Way. It is





considered that “the squaring off” of Public Open Space reserve in a central position to service the needs of the future residential community has merit. The structure plan has therefore identified an area of 1,584m<sup>2</sup> which achieves this “rounding off” of open space into a more usable distribution of recreational space.

Notwithstanding, it is noted that the site is identified in the draft Green Growth Plan and as being regionally significant Swan Bioplan which was not previously addressed by the structure plan. On this basis, it will be necessary for Lot 9001 to provide 10% of its total land area as public open space at the time of subdivision. Additional public open space may be required at the time Lot 401 Hampton Road is subdivided, which would be at the discretion of the Western Australian Planning Commission.

## 5.4 Movement Networks

It is intended that the proposed development on the subject site will be accessed via a subdivisional road off Hampton Road which will extend into a “loop” road system to also service the adjoining Lot 42 in accordance with the indicative structure plan considered by Council at its April 2006 round of meetings.

The width of the internal road network is proposed at 18m with a pavement width of 6m. A dual use path system is proposed within the subdivisional road reserve to connect with the pedestrian and cycle way system for development to the south with a link connecting into the Public Open Space area.



# 06

## Planning and Development Considerations

### 6.1 Subdivision Application

A “Green Title” subdivision application reflecting the proposed structure plan will be submitted with the Western Australian Planning Commission. In accordance with the provisions of the Shire of Murray Town Planning Scheme No 4, development of land within the “Residential Development” zone cannot be supported by the Shire until such time as a structure plan has been approved by the Western Australian Planning Commission. It is therefore intended that once the structure plan has been considered and assessed by the Murray Shire Council and any submissions received have been determined and forwarded onto the Western Australian Planning Commission, that a subdivision application, reflecting the provisions of the structure plan, will be submitted to the Department for Planning for approval.

### 6.2 Bushfire Management

A bushfire management plan has been prepared for the site and is to be implemented at the subdivision and development stages.

Dwellings located in areas with a bushfire attack level rating of between BAL-12.5 and BAL-29 should be constructed to an appropriate standard as required by *Australian Standard 3959: Construction of Buildings in Bushfire Prone Areas* and any amendments thereto.

Refer Appendix 4 – Bushfire Management Plan.



# 07

## Conclusion

The proposed structure plan accommodates the various elements affecting the subject site and achieves the objectives by the Shire of Murray in its Town Planning Scheme No 4. The proposed road and lot layout will compliment and integrate residential development, both existing and proposed, in the surrounding area and enable future subdivision of the subject site in a logical and coordinated manner.

Protection of remnant vegetation on site can be achieved via a proposal put forward by Ecoscape Australia Pty Ltd using an "offset" process for the relocation of higher value vegetation onto the nearby reserve to the west of Hampton Road, presently managed by the Department for Environment and Conservation that forms part of a larger, more representative grouping of proposed Regional Open Space land being considered by the Western Australian Planning Commission for Reservation under the Peel Region Scheme.

On this basis, it is requested that the Western Australian Planning Commission adopt the attached structure plan as it is consistent with zoning under the Shire of Murray Town Planning Scheme No 4 and the urban zoning under the Peel Region Scheme to supply additional residential lots within the Pinjarra town site which are in high demand.





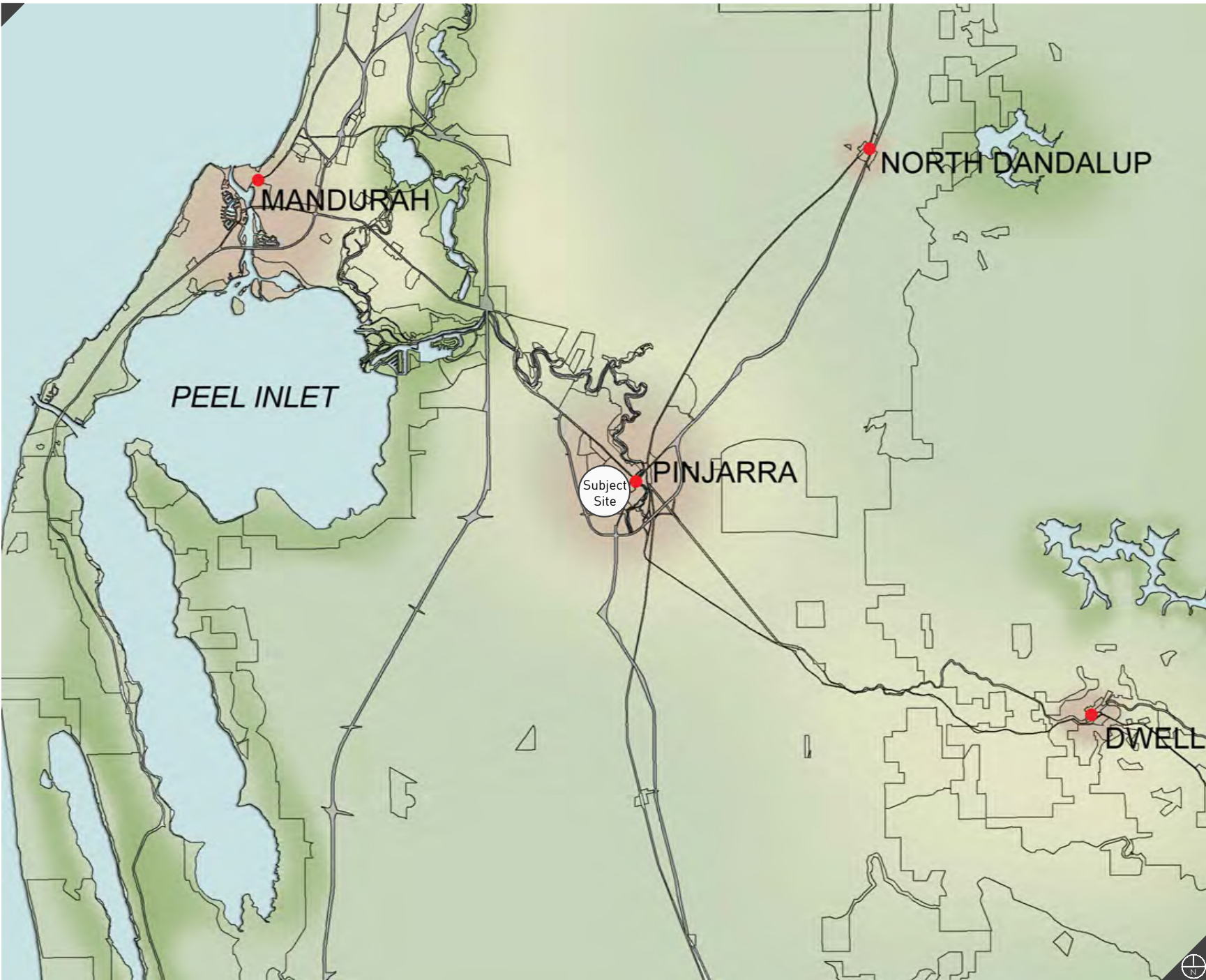
# FIGURES



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# Regional Location

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Matt Sullivan 5 April 2017

Lots 401 & 9001 Hampton Street  
Pinjarra

Planning Design Delivery



## REVISIONS

Rev	Date	Drawn
A	2017.04.05	M. Sullivan



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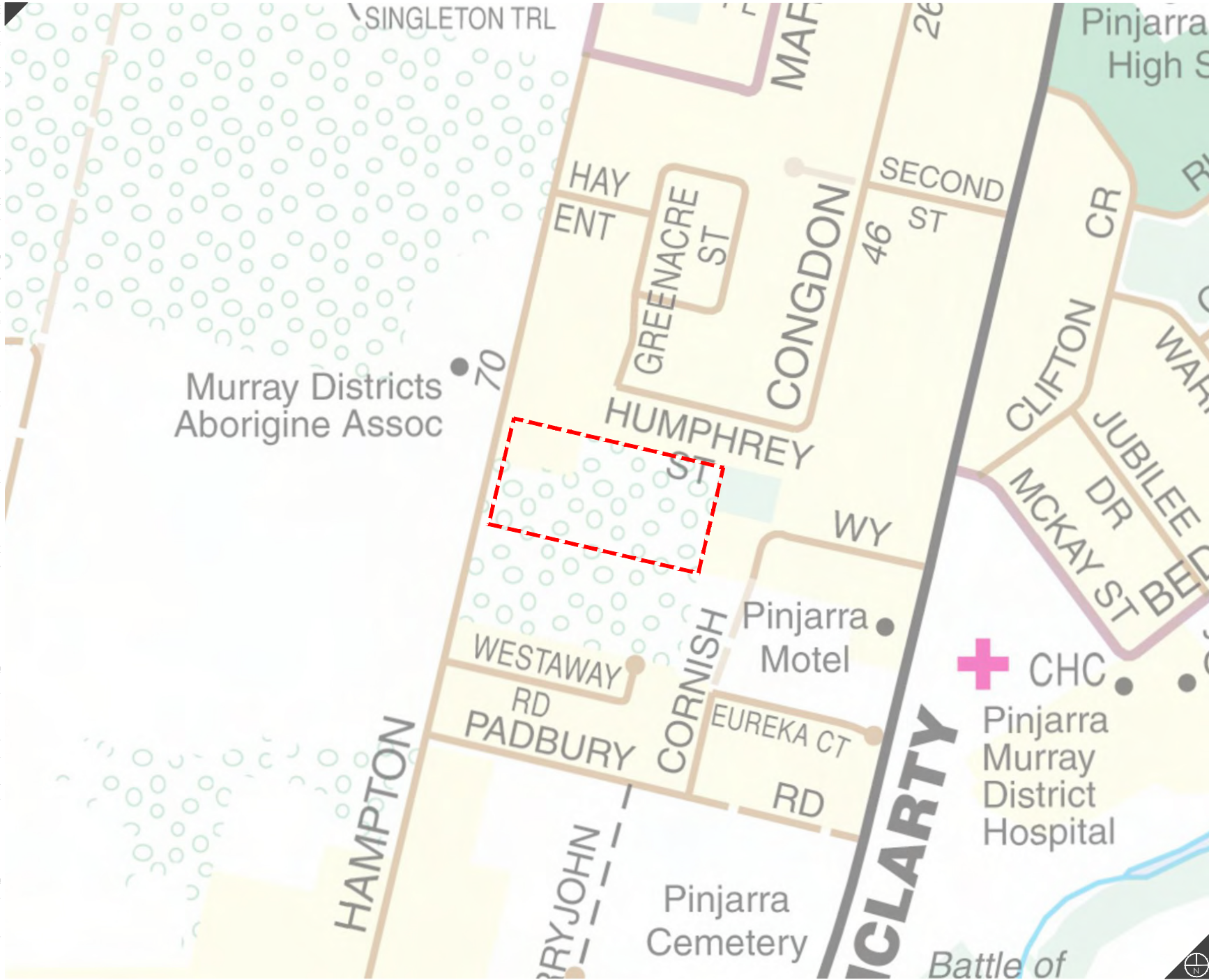
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Job Ref:	8633
Scale:	NTS @ A4
Client:	Corkar Pty Ltd
Designer:	R. Dial
Drawn:	M. Sullivan
Projection:	N/A
Plan ID:	8633-FIG-01-A

Map supplied by WA Planning Commission

Figure 1



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Lots 401 & 9001 Hampton Street  
Pinjarra

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LEGEND  
--- Subject Site

0 125 Metres

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Map supplied by Streetsmart

# Local Location

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Figure 2



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Planning Design Delivery



LEGEND

- Subject Site
- Contours
- Existing Lot Numbers
- Existing Boundaries
- Water
- Sewer

0 50 Metres

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Projection: MGA50 GDA94  
Plan ID: 8633-FIG-03-A  
Cadastral supplied by Water Corporation of WA

Site Plan

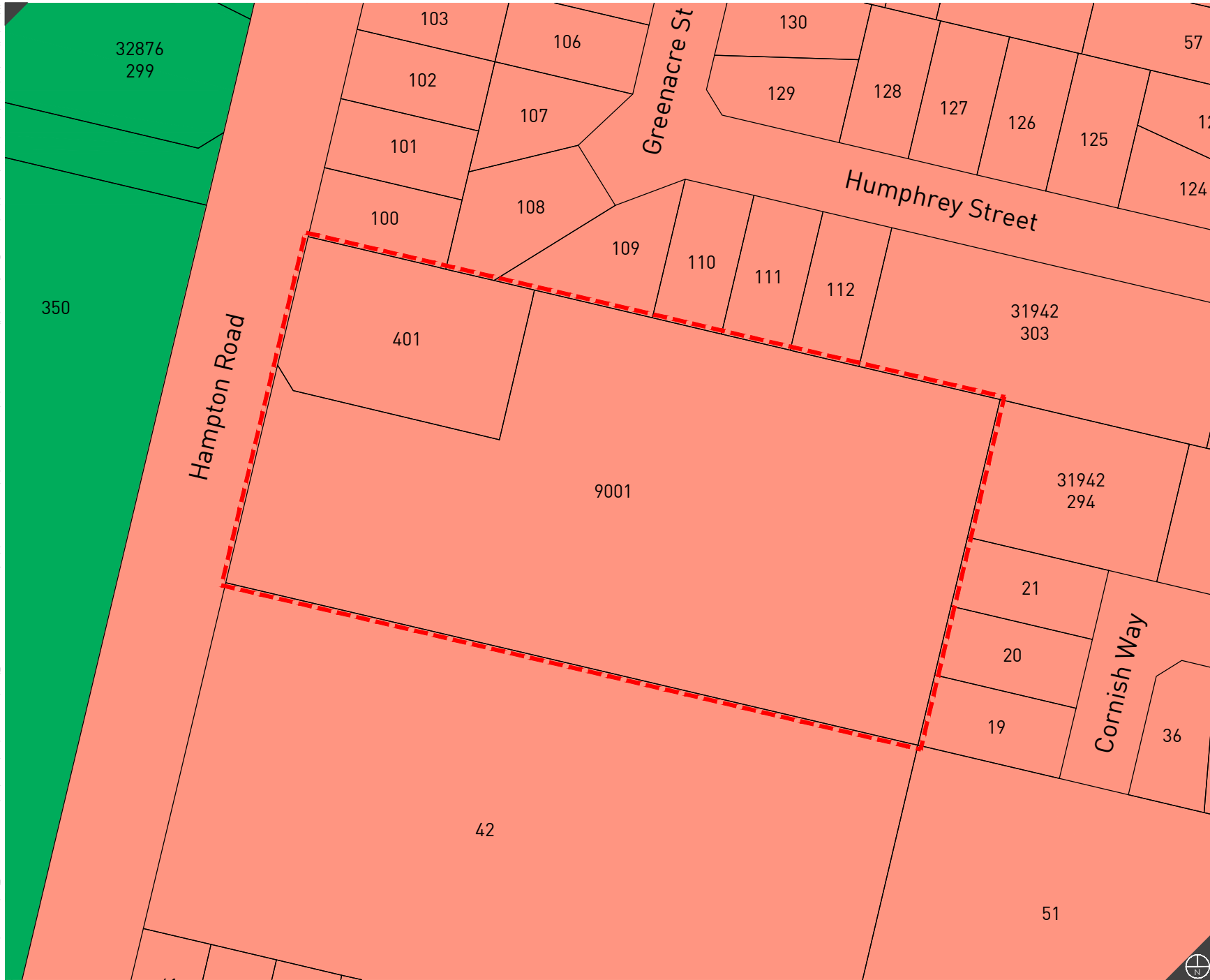
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Lots 401 & 9001 Hampton Street  
Pinjarra

Figure 3



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Planning Design Delivery



**LEGEND**

- Subject Site
- 7 Existing Lot Numbers
- Existing Boundaries

**RESERVED LANDS**

- Regional Open

**ZONES**

- Urban

0 50 Metres

**REVISIONS**

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# Peel Region Scheme Zoning

Lots 401 & 9001 Hampton Street  
Pinjarra


Figure 4






 Subject Site  
 Existing Lot Numbers  
 Existing Boundaries

 Regional Open Space

 Public Recreation / Conservation

 Residential

 Residential Development

	No Zone
	R-Codes

0 50 Metres

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Cadastral supplied by Water Corporation of WA

# Town Planning Scheme No.4 Zoning

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**Lots 401 & 9001 Hampton Street  
Pinjarra**

### Figure 5

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# TECHNICAL APPENDICES



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# APPENDIX 1

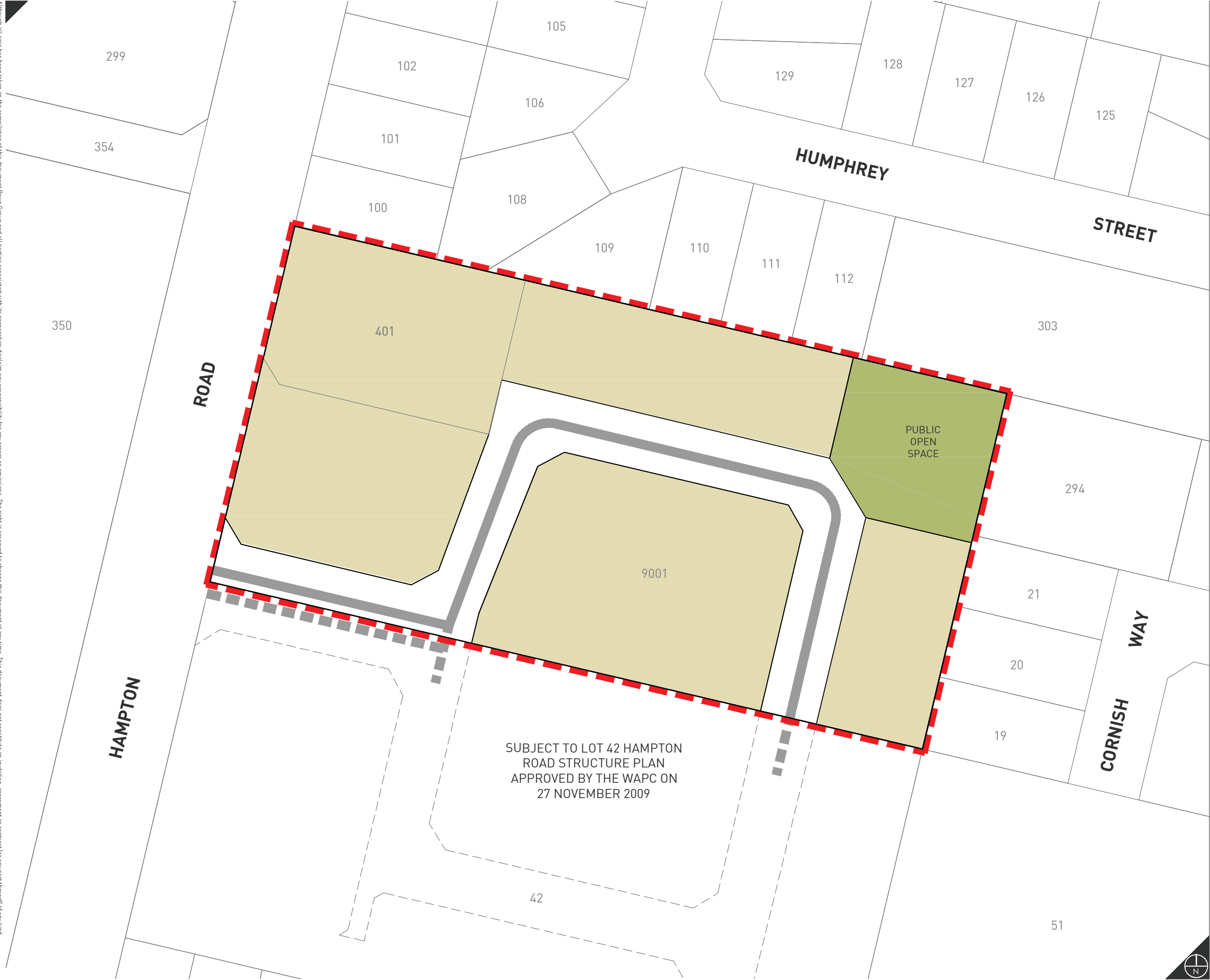
STRUCTURE PLAN



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Planning Design Delivery



- LEGEND
- Structure Plan Boundary
  - Existing Lot Numbers
  - RESIDENTIAL
    - Residential - R20
  - PARKS, RECREATION & CONSERVATION
    - Public Open Space
  - TRANSPORT
    - Access Street - Local Road

0 25 50 Metres

REVISIONS		
Rev	Date	Drawn
A	2017.03.30	W. Clements
B	2017.04.12	W. Clements



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e: info@rowegroup.com.au  
p: 08 9221 1991

Date Drawn: 2017.03.30  
Job Ref: 8633  
Scale: 1:1000 @ A3  
Client: Corkar Pty Ltd  
Designer: R. Dial  
Drawn: W. Clements  
Projection: MGA50 GDA94  
Plan ID: 8633-LSP-01-B

Aerial Photography captured and supplied by Nearmap

# Structure Plan

N:\TOWN PLANNING\8000-8999\8633\DRAWING\A-CAD\8633\_LSP01B\_20170412\_(LOCAL STRUCTURE PLAN).DWG  
William Clements 12 April 2017

Lots 401 and 9001 Hampton Road  
Pinjarra





# APPENDIX 2

CERTIFICATE OF TITLES



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WESTERN



AUSTRALIA

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

REGISTER NUMBER	
<b>9001/DP58906</b>	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
<b>3</b>	<b>29/1/2016</b>

VOLUME  
**2687**FOLIO  
**94**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 9001 ON DEPOSITED PLAN 58906

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

CORKAR PTY LTD OF PO BOX 4218 MANDURAH

(T N224048 ) REGISTERED 12/1/2016

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION SEE DEPOSITED PLAN 58906
2. EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION SEE DEPOSITED PLAN 58906

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND: DP58906  
PREVIOUS TITLE: 1683-158  
PROPERTY STREET ADDRESS: NO STREET ADDRESS INFORMATION AVAILABLE.  
LOCAL GOVERNMENT AUTHORITY: SHIRE OF MURRAY



WESTERN



AUSTRALIA

**RECORD OF CERTIFICATE OF TITLE**  
UNDER THE TRANSFER OF LAND ACT 1893

REGISTER NUMBER <b>401/DP58906</b>	
DUPLICATE EDITION <b>1</b>	DATE DUPLICATE ISSUED <b>30/4/2008</b>

VOLUME  
**2687**FOLIO  
**93**

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.



REGISTRAR OF TITLES

**LAND DESCRIPTION:**

LOT 401 ON DEPOSITED PLAN 58906

**REGISTERED PROPRIETOR:**  
(FIRST SCHEDULE)

COLIN EDWARD POMERY  
WENDY MAREE POMERY  
BOTH OF 75 HAMPTON ROAD, PINJARRA  
AS JOINT TENANTS

(AF K576524 ) REGISTERED 24/4/2008

**LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:**  
(SECOND SCHEDULE)

1. EASEMENT BURDEN CREATED UNDER SECTION 167 P. & D. ACT FOR SEWERAGE PURPOSES TO WATER CORPORATION SEE DEPOSITED PLAN 58906
2. \*K576525 NOTIFICATION SECTION 165 PLANNING & DEVELOPMENT ACT 2005 LODGED 24/4/2008.
3. \*K628205 MORTGAGE TO UNITED CREDIT UNION LTD REGISTERED 17/6/2008.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.  
\* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.  
Lot as described in the land description may be a lot or location.

-----END OF CERTIFICATE OF TITLE-----

**STATEMENTS:**

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SKETCH OF LAND: DP58906  
PREVIOUS TITLE: 1683-158  
PROPERTY STREET ADDRESS: 75 HAMPTON RD, PINJARRA.  
LOCAL GOVERNMENT AUTHORITY: SHIRE OF MURRAY





# APPENDIX 3

## LOCAL WATER MANAGEMENT STRATEGY



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# LOCAL WATER MANAGEMENT STRATEGY

**CORKAR PTY LTD**

**L9001 HAMPTON ROAD PINJARRA**



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Project -							
Rev	Description	Orig	Review	Structerre approval	Date	Client Approval	Date
A	Issue for Approval	ES	KC		09/05/16		
B	RFI response	ES	RL		15/07/16		
C	RFI response	ES	RL		11/08/16		
D	RFI response	ES	RL		18/08/16		



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## EXECUTIVE SUMMARY

This Local Water Management Strategy (LWMS) has been prepared by StrucTerre to support the Outline Development Plan (ODP) for L9001 (Formally Lot 41) Hampton Road, Pinjarra (the subject site). The purpose of the LWMS is to provide objectives, criteria and requirements for the protection of the water cycle as part of land use planning and development at all levels of the planning system of the ODP.

The 1.77 Ha site is located within the municipality of the Shire of Murray and is located approximately 80km south of Perth and 18km east of Mundurah. The ODP proposed a total of 24 single residential allotments with an average lot area that is above the minimum area stipulated by the R20 Density Code and a 1571m<sup>2</sup> public open space.

Council has approved an ODP for landholdings to the south and east of the lots includes lots 42 and 43 Hampton Road and 50 and 51 McLarity Road. The ODP and LWMP design takes into consideration the road and drainage networks links between the subject site and adjacent lots.

An Urban Water Management Plan (UWMP) was prepared for Lot 43 and 50 Hampton Road and was approved by the DoW and council in late 2007. The design of the drainage system at Lot 42 reflects the design of Lots 43 and 50. The design includes a compensating basin that serves Lot 42 and Lot 9001, as well as lots 43 and 50. The basin is spread over the four lots. For this LWMS, only a small portion of Lot 9001 is proposed to enter the compensating basin in lot 42.

The design of Lot 9001 does not require subsoil drainage system as the proposed pads levels are to be increased using fill to be at least 1.5m above the ground water level

The overall approach to water conservation is to reduce the amount of scheme water required within the development at a lot and estate scale. Within the lot, potable water consumption will be reduced by promoting water efficient fixtures and appliances (WEFA) and water wise gardening (WWG) principles within lot gardens. On an estate scale, groundwater will be utilised for irrigation of the landscaped areas within the Public Open Space (POS) areas which will also utilise WWG principles.

The overall approach for the stormwater quality and quantity is to treat water as close to the source as possible with in lot treatment and a bio retention basin for treatment of the road impervious area. The stormwater quantity will be managed by locating an infiltration basin in the POS sized for all storm events up to the 1 in 100 year ARI.



## 1. INTRODUCTION

### 1.1. PLANNING BACKGROUND

This report has been prepared to support the Outline Development Plan (ODP) for Lot 9001 Hampton Road, Pinjarra. The 1.77 Ha site is located with municipality of the Shire of Murray. The site is located approximately 80km south of the Perth Central Area and approximately 18km east of the Mandurah Regional Centre. The location of the site is shown in Figure 1.



Figure 1 Regional Location

Under the provisions of the Peel Region Scheme (PRS), the subject site is zoned Urban. Under the provisions of the Shire of Murray Town Planning Scheme No. 4 (TPS 4), the subject site is zoned Residential Development.

A separate ODP submission has been lodged and approved with Council for Lot 42 Hampton Road. Both ODPs depict the adjoining lots subdivision to demonstrate the linkages between the two sites and coordinated approach undertaken.

In terms of water management, the site falls into the Peel Harvey Catchment area. The site will be covered by the Murray Drainage and Water Management Plan prepared by the Department of Water (DoW).

### 1.2. TOTAL WATER CYCLE MANAGEMENT – PRINCIPLES & OBJECTIVES

The process of management the total water cycle in an urban scenario is referred to as Water Sensitive Urban Design (WSUD). The LWMS seek to support WSUD by assisting to design, develop and maintain urban water systems that are sensitive to the water cycle. The principles of WSUD as outlined in the Model Peel Harvey Water Sensitive Urban Design Local planning policy (DPI, 2006) have been used for this LWMS:



- Provide protection to life and property from flooding that would occur in a 100 year Average Recurrence Interval (ARI) flood event;
- Manage rainfall events to minimise runoff as high in the catchment as possible. Use multiple low cost 'in-system' management measures to reduce runoff volumes and peak flows (for example, maximise infiltration from leaky pipes and stormwater pits installed above pollutant retentive material);
- Retain and restore existing elements of the natural drainage system, including waterway, wetland and groundwater features, regimes and processes, and integrate these elements into the urban landscape, possibly through a multiple use corridor;
- Maximise water use efficiency, reduce potable water demand, and maximise the re-use of water harvested; and
- Minimise pollutant inputs through implementation of appropriate non-structural source controls (such as town planning controls, strategic planning controls, pollution prevention procedures, education and participation programs and regulatory controls) and structural controls (that manage the quantity and quality of stormwater runoff and prevent or treat stormwater pollution)

### 1.3. EXISTING LANDUSE

The subject site has been used in the past and present for single residential purposes. Some minor saw mill operations have been undertaken on the site in the past as well. The site contains some remnant bushland features.

The subject site is situated on the western edge of the residential areas of the Pinjarra Town site. To the north, south and east are areas either developed for residential purposes or zoned appropriately for residential purposes. To the west of the subject site, located are regional reserves existing along the rural zoned land.

## 2. PROPOSED DEVELOPMENT

### 2.1. KEY ELEMENTS OF THE STRUCTURE PLAN

The ODP proposes a total of 24 single residential allotments with an average lot area that is above the minimum area stipulated by the R20 Density Code.

A 1,571m<sup>2</sup> Public Open Space (POS) is proposed in the north east corner of the development.

The proposed ODP has been prepared to demonstrate the intended urban development pattern for the subject site. The ODP has been prepared with due regards to the local planning framework and urban layout and development over the neighbouring landholdings. In this regard, Council has recently approved the ODP for Lot 42 and for the landholdings to the south and east of the subject site, which incorporates Lots 50 and 51 McLarty Road and Lot 43 Hampton Road.

The development does not include an allocation of land for drainage purposes.

The road layout has been designed so that each of the Lots 43, 50 and 51 can be developed independently from Lots 42, 44 and 45.

### 2.2. PREVIOUS STUDIES

An environmental study, of the adjoining development, Environmental Assessment of Lot 42 Hampton Road, Pinjarra, Shire of Murray, was prepared by ENV in 2008. A geotechnical report and preliminary acid sulphate soils assessment has been undertaken by Douglas Partners (2007).

### 2.3. OBJECTIVES

This LWMS aims to address the issues of water quality and quantity at the strategy level. This includes the initial phases of work measures to:

- Ensure that groundwater and surface water are managed through drainage and fill in such a way that the site does not flood or become water logged;



- Reduce scheme water and nutrient use in the subdivision; and
- Minimise the export of nutrients from the site.

### 3. PREDEVELOPMENT ENVIRONMENT

#### 3.1. SOILS AND TOPOGRAPHY

The site is generally flat, with an elevation of approximately 10-11m AHD based on Department of Agricultural soil mapping (2005) as shown in Figure 2. The site comprises of two major geomorphologic units:

- Bassendean Sand; and
- Bassendean over Guildford Formation.

Bassendean over Guildford Formation covers most of the site with Bassendean Sand formation to the south of the development.

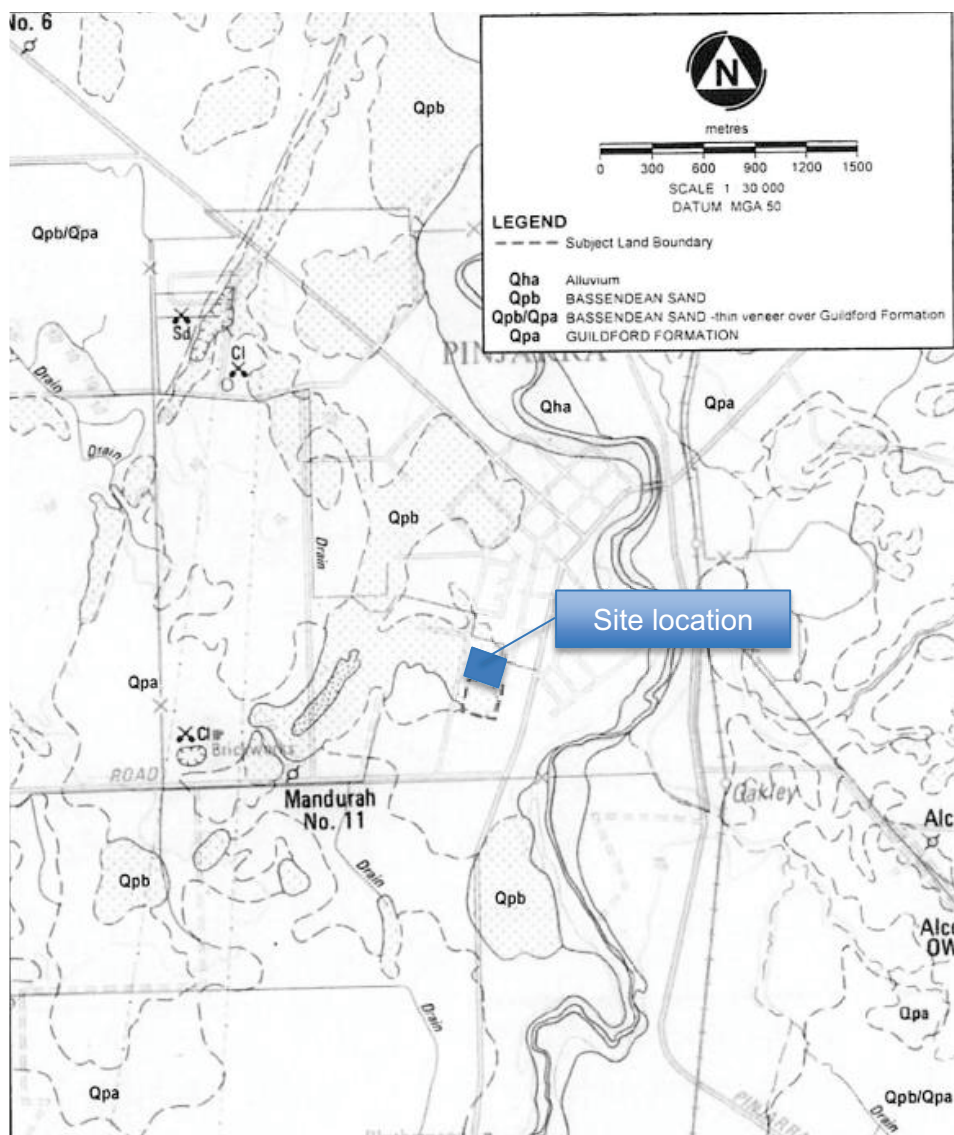


Figure 2 Geology Map



Investigation by ENV and Douglas Partners (2007) indicate that Lot 9001 is considered Bassendean Sand overlying Guildford Formation. The Guildford formation appears to commence at a depth of between 1 and 5m BGL. The Guildford formation on the site is highly variable both vertically and horizontally, with soil types varying from grey clay, through silty sands to black or orange pebbles, being remnants of former marine animals.

Soil logs from the bores on Lot are shown in the Appendix B. Bores MW1, MW2, MW6, MW7 and MW8 are located on lot 9001. The Douglas Partners investigation is shown in Appendix C.

### **3.1.1.ACID SULPHATE SOILS**

The Western Australia Planning Commission has produced acid sulphate soil risk mapping for areas around the state. The maps show low, medium and high risk areas for the presence of Acid Sulphate Soils (ASS). The risk mapping is indicative only and requires ground-truthing, but does provide a guide to the likelihood of acid sulphate soils being present in the area.

The mapping indicates the site has a moderate to low risk of acid sulphate soil occurring within 3m of the natural ground surface. Based on this, a preliminary survey of ASS was undertaken by Douglas Partners (2007) refer Appendix C. Potential ASS was identified on the adjoining lot at a depth greater than 2m in a previous investigation. It is a reasonable assumption to make that Lot 9001 would be of similar in nature. Additional investigations into Acid Sulphate Soils may be required on lot 9001.

### **3.1.2.SOIL CONTAMINATION**

The assessment includes initial consideration of historical land use and the potential for contamination. It appears that the site was previously the location of a small scale/private saw mill. However, due to the very limited works conducted, mainly as a hobby (personal communication Brett Flugge Shire of Murray), it is considered that a Preliminary Site Investigation (PSI) is not necessary.

## **3.2. SURFACE WATER FLOWS AND QUALITY**

There are no existing surface water channels within Lot 9001. However, surface water flows will occur after heavy rain. If this is the case, the flow on the site and at the catchment level would be generally in a westerly direction towards the verge of Hampton Road.

The main surface drainage direction exiting the site is westerly, overland through the multiple use wetland area towards Pollard Road, and then heading west. The easterly flow will most likely occur along the Greenlands Road drain and then into the Peel Harvey Estuary. The Greenland Road drain is an open drain that follows the Greenlands Road easement.

The proposed site is located outside the 1 in 100 ARI floodplain extent of the Murray River.

## **3.3. GROUNDWATER FLOWS**

The complex geology of the site means that the groundwater hydrology of the site is highly complex. Factors that lead to this complex system are:

- The top layer of sand on site is perched;
- Sand Layer is Variable;
- Presence of the high pervious gravel sized pebble layer in some bore results.

Groundwater levels on the site were measured by the consultant ENV between February and November 2008. The monitoring initially consisted of four bores located on Lot 9001 and 42. However when the complexity of the ground water system could not be resolved, despite three rounds of monitoring and re-surveying of bore casings, it was decided to install an additional five bores on the two lots in July 2008.

The results indicated that there is a variation in groundwater levels. The two highest groundwater levels were recorded in the south east, with the lowest in the north. This implies that there are multiple aquifers present and interception by the bores, and that perching effects are common and highly localised. As such it is not



possible to provide meaningful groundwater contours and flow direction for this site. Because of this, the geology and hydrology of the central bore on the site will be discussed individually.

The ground water pit locations and depths are shown in Appendix A.

#### MH1

MW1 is located in the north west corner of the site. The bore is 5.0 deep. The ground water level at this site is estimated at approximately 0.964 m BGL.

#### MH2

MW2 is located in the north east corner of the site. The bore is 5.0 deep. The ground water level at this site is estimated at approximately 0.57m BGL.

#### MW6

MW6 is located in the south west corner of the site. The bore is 3.3m deep. The lithology consisted of approximately 3.1m of grey sand over a layer of coffee rock at least 0.2m thick. The ground water level at this site has varied from 9.36 to 9.96 AHD or 0.92 to 1.53m BGL. The ground water has always been in the upper, sandy layer.

#### MW7

MW7 is located in the south central part of the site. The bore is 3.8m deep. The lithology consisted of approximately 2.4 m of grey to white sand over a layer of brown sand (2.4 to 3.2m BGL) and then at least 0.55mm coffee rock. The ground water level at this site varies from 9.13 to 9.87 AHD or 1.16 to 1.89 BHL. The groundwater has always been in the upper, sandy layer.

#### MW8

MW8 is located in the south east corner of the site. The bore is 3.75m deep. The lithology consists of approximately 2m of grey to white sand over a layer of 0.25m of coffee rock, followed by 0.5m of sandy clay and 0.25m of clay before returning to grey sand between 3 to 3.75m BGL. The groundwater level at this site has been consistently around 9.95m AHD or 1.1 BGL. The ground water has always been in the upper, sandy layer.

#### MH9

MW9 is located in the north corner of the site. The bore is 5.0 deep. The ground water level at this site is estimated at approximately 1.10m BGL.

In conclusion, the groundwater on the site is generally present in the upper sandy layer but the ground water level are affected by perching and deeper aquifers, resulting in variable groundwater levels. Additional winter monitoring is suggested for this site to confirm the groundwater levels found.

### **3.4. GROUNDWATER QUALITY**

The guideline for nutrient levels in groundwater in the Peel Harvey Catchment is identified in the Murray Drainage Water Management Plan (DoW, 2011) which sites the table 1 criteria, based upon the environmental Protection Peel Inlet – Harvey Estuary Policy (EPA, 1992).

**Table 1 –Target for Total Nitrogen and Total Phosphorus Concentration**

	Nitrogen (kg/ha/year)	Nitrogen (mg/L)	Phosphorus (kg/ha/year)	Phosphorus (mg/L)
Target	2.4	1.2	0.3	0.15

Ground water quality has been sampled on two occasions at Lot 9001 and Lot 42 and shown in Table 2. This data provides a pre-development baseline for the nutrient concentration for groundwater within the site.



Groundwater in the area shows slightly elevated levels of total phosphorus and compared to the Murray Drainage Water Management Plan Target. The Phosphorus levels are within target.

**Table 2 Groundwater Quality**

Monitoring Well ID	Date	Total N (mg/l)	Total P (mg/L)
MW1	11/02/2008	1.2	0.49
	26/03/2008	2.4	0.33
Average		2.2	0.41
MW2	11/02/2008	2.1	0.39
	26/03/2008	1.5	0.28
Average		1.8	0.34
MW3	11/02/2008	5.9	0.2
	26/03/2008	6.3	0.28
Average		6.1	0.23
MW4	11/02/2008	1.6	0.15
	26/03/2008	2.0	0.13
Average		1.8	0.14
Target		1.2	0.15

### 3.5. WETLANDS

The site is surrounded by a number of palusplian wetlands.

### 3.6. VEGETATION

The vegetation of the adjoining lot was surveyed as part of the Environmental Assessment of Lot 42 Hampton Road, Pinjarra, Shire of Murray (ENV, 2008). It is reasonable to assume the results will be similar to what will be found on Lot 9001. The conclusions are:

- Remnant native vegetation condition ranges from good to completely degraded condition;
- No declared rare or priority flora taxa were located;
- Lot 42 occurs on the Cassendean Complex – Central and South ENV vegetation units BaGt\*EC and BaMii&Ec were considered to be a “best fit” with Fouristic community Type SCP21a (Banksia attenuate – Eucalyptus marginata Woodlands (Givson et al. 1994);
- The site does not support any Priority or Threatened Ecological Communities;
- Given the small size of the area of remnant vegetation within the site is relatively small (less than 4ha), contains no significant flora or vegetation communities, and has a relatively degraded condition, that the site’s vegetation is unlikely to be regarded as regionally significant vegetation or a constraint to development.

As this report does not cover Lot 9001, additional investigation to the area may be required.

### 3.7. FAUNA

The proposed development of Lot 9001 would not be expected to have any significant impact on the regionally widespread fauna within the vicinity of the project area. The site consists of a woodland habitat, considered to be of little fauna value. The diversity of the fauna that may be supported by this habitat is severely limited as a result of:

- The lack of microhabitats for fauna to exploit to refuge; and
- The high level of urban disturbance surrounding the site.



#### 4. DESIGN CRITERIA AND OBJECTIVES

This section outlines the objectives and design criteria that this LWMS and the future UWMP must achieve.

##### 4.1. INTEGRATED WATER CYCLE MANAGEMENT

The State Water Strategy (Government of WA 2003) endorses the promotion of integrated water cycle management and application of water sensitive urban design (WSUD) principles to provide improvements in the management of stormwater, and to increase the efficient use of other existing water supplies.

Integrated water cycle management addresses not only physical and environmental aspects of water resource use and planning, but also integrates other social and economic concerns. Stormwater management design objectives should therefore seek to deliver better outcomes in terms of:

- Water conservation;
- Groundwater management;
- Flood mitigation; and
- Stormwater quality management.

The first step in applying integrated water cycle management in urban catchments is to establish agreed environmental values for receiving waters and their ecosystems. Guidance regarding environmental values and criteria is provided by a number of National and State policies and guidelines and site specific studies undertaken in and around the site development.

The overall objective for preparing integrated water cycle management plans for proposed residential developments is to minimise pollution and maintain the existing hydrological regime. This objective is central to the water management approach for the site.

##### 4.2. WATER CONSERVATION

Water conservation design criteria have been determined in line with the guidelines presented in Better Urban Water Management (WAPC 2008). The following water conservation criteria are proposed:

###### WC Design Objective 1

Consumption target for water of 100 kL/person/yr, (State Water Plan target) including not more than 40-60 kL/person/yr scheme water.

###### WC Design Objective 2

Maintain a maximum irrigation rate of 6,750kL/ha/yr in POS areas.

##### 4.3. STORMWATER MANAGEMENT

The stormwater management principles and the guidance are to be in accordance with the Stormwater Manual of Western Australia. The following stormwater management design criteria are proposed:

###### SW Design Objective 1

All runoff up to the 100 year ARI event is to be retained on site.

###### SW Design Objective 2

Finished floor levels must have a minimum of 300 mm clearance above the 100 year ARI flood levels within road reserve.

###### SW Design Objective 3

Ensure minor roads remain passable in a 5 year ARI event.

###### SW Design Objective 4

Retain and treat runoff from the 1 year 1 hour ARI event as close to source as possible.



#### SW Design Objective 5

Reduce nutrient loads by applying appropriate non-structural measures.

#### **4.4. WATER QUALITY MANAGEMENT**

Maintain surface and ground water quality at pre-development levels (winter concentrations) and, if possible, improve the quality of water leaving the development area to maintain and restore ecological systems in the sub-catchment in which the development is located.

##### Criteria

Contaminated sites - To be managed in accordance with the Contaminated Sites Act 2003.

All other land - If the pollutant outputs of development (measured or modelled concentrations) exceed catchment ambient conditions, the proponent shall achieve water quality improvements in the development area or, alternatively, arrange equivalent water quality improvement offsets inside the catchment. If these conditions have not been determined, the development should meet relevant water quality guidelines stipulated in the National Water Quality Management Strategy (ANZECC and ARMCANZ, 2000).

Drainage - Ensure that all run-off contained in the drainage infrastructure network receives treatment prior to discharge to a receiving environment consistent with the Stormwater Management Manual. In addition, all outflows from subsoils should receive treatment prior to discharge to the stormwater system.

Stormwater modelling criteria - If it is proposed to use a stormwater modelling tool to demonstrate compliance with design objectives, the following design modelling parameters are recommended. As compared to a development that does not actively manage stormwater quality:

- At least 80 per cent reduction of total suspended solids;
- At least 60 per cent reduction of total phosphorus;
- At least 45 per cent reduction of total nitrogen;
- At least 70 per cent reduction of gross pollutants.

##### Commitment

The development proposes to use Best Management Practices in line with the Stormwater Management Manual to manage surface water and groundwater quality. The development does not include subsoil drainage.

The development is not considered to be a contaminated site.

For this development the size of the bio-retention basin was sized based on 2% of the upstream impervious area. The size may be further refined during the UWMP stage.

#### **4.5. DISEASE VECTOR AND NUISANCE INSECT MANAGEMENT**

To reduce health risks from mosquitoes, retention and detention treatments should be designed to ensure that between the months of November and May, detained immobile stormwater is fully infiltrated in a time period not exceeding 96 hours. Permanent water bodies are discouraged, but where accepted by DoW, must be designed to maximise predation of mosquito larvae by native fauna to the satisfaction of the local government on advice of the Departments of Water and Health.

##### Commitment

The system has been designed to ensure that the detained immobile stormwater is fully infiltrated in a time period not exceeding 96 hours.

Permanent water bodies are not proposed for this site.



## 5. WATER SOURCE ALLOCATION, INFRASTRUCTURE, FIT-FOR PURPOSE AND WATER USE

### 5.1. FIT FOR PURPOSE WATER USE

Conservation of water through fit-for-purpose use is encouraged so that scheme water is not wasted. Fit-for-purpose describes the use of water that is of a quality suitable for its required use.

### 5.2. SCHEME WATER

Scheme water will be supplied by Water Corporations Integrated Water Supply System (IWSS).

### 5.3. RAINWATER TANKS (RWT)

Collection of runoff from roof surfaces can be undertaken, with this water stored within rainwater tanks (RWT) for later use. This water is of high quality however in urban environments this water is considered non-potable. Stored rainwater may be used for some irrigation requirements however this will need to be supplemented with scheme water during the lower rainfall months. During the higher rainfall months the majority of the stored rainwater can be used to supplement internal building non-potable uses. The water efficiency strategy recommends that rainwater is used in washing machines, toilets and hot water systems.

RWTs will not be mandated for the site however they will be promoted by the proponent at point of sale by providing educational literature regarding the benefits of their use.

## 6. WATER CONSERVATION STRATEGY

Scheme water will be imported onto the site for internal and external household use. Wastewater from internal household use will be exported from the site via the Water Corporation wastewater system. Reducing scheme water use in this system can be undertaken by either reduction of use through water saving devices and low water use gardens or by substituting with other sources.

### 6.1. WATER EFFICIENT FIXTURES AND APPLICATIONS (WEFA)

Significant reductions in in-house water uses can be achieved with the use of WEFA. Table 3 provides an example of the water uses of typical appliances versus water efficient appliances. These water use rates have been used in the water balance analysis.

**Table 3 Water Efficient Fixtures and Appliances**

Appliance	Water Use	
	Standard Device	Water Saving Device
Toilet	12 Litres/Flush	4 Litres/Flush
Washing Machine	130 Litres/Wash	40 Litres/Wash
Dishwashers	50 Litres/Wash	25 Litres/Wash
Showerhead	15-25 Litres/Minute	6-7 Litres/Minute
Taps	15-18 Litres/Minute	5-6 Litres/Minute

The water conservation strategy proposes that all dwellings use WEFA. Water efficient fittings are mandated as part of the building approvals process, while uptake of water efficient appliances can be encouraged by state and local government rebates, as well as education from the proponent at point of sale.

#### 6.1.1. WATER WISE GARDENS (WWG)

Reductions in water use for irrigation by employing water efficiency measures can significantly reduce the total water usage. The following water efficiency measures may be used:

- Where required, soil shall be improved with soil conditioner certified to Australian Standard AS4454 to a minimum depth of 150 mm where turf is to be planted and a minimum depth of 300 mm for garden beds;
- Garden beds to be mulched to 75 mm with a product certified to Australian Standard AS4454;
- Implementation of hydrozoning design practices, which will group plant species with similar / same irrigation requirements;



- Irrigation systems will have emitters which disperse coarse droplets to minimise losses to evaporation;
- Irrigation will not be utilised during winter months and rain sensors will be utilised;
- The adoption of xeriscaped gardens (garden beds are landscaped using 'waterwise plants', which are local native species that require less water).
- Minimising turf areas where possible; and
- Educating the community to increase awareness of water conservation.

WWG principles will be utilised within POS and road reserves with an average irrigation rate of 6,750 kL/ha/year maintained. Uptake of WWG practices for lot landscaping will be encouraged by the proponent at point of sale of lots.

## 6.2. ESTATE SCALE WATER USAGE

The water usage at the estate scale has been determined by the amount of POS provided and any additional areas which will require irrigation. There is approximately 1,571 m<sup>2</sup> of POS provided.

The POS areas will incorporate native shrub planting and turf spaces for informal recreational purposes equating to approximately 1374 kL/annum, based on an average irrigation rate of 6,750 kL/ha/annum.

Based on the above, the estate scale water usage equates to approximately 1374 kL/annum for the site. A detailed irrigation schedule will be provided in future UWMPs. A temporary allocation for dust suppression may also be required for construction purposes the total of which will be confirmed at UWMP stage.

## 7. STORMWATER MANAGEMENT STRATEGY

The stormwater management strategy for the site is to retain surface flows and to infiltrate the stormwater runoff as close to source as possible. The overall approach to managing stormwater within the site is also consistent with the integrated water cycle management approach.

### 7.1. STORMWATER MANAGEMENT APPROACH

The development drainage system has been designed to achieve the objectives and criteria stated in Section 4.3. Surface runoff modelling undertaken using XP storm has been used to inform the design of stormwater infrastructure. Modelling assumptions are identified in section 7.2

The drainage for Lot 9001 will be directed to the POS are for treatment by a Bio-Retention Area (BRA) and Flood Storage Area (FRA).

### 7.2. MODELLING ASSUMPTIONS

The hydrologic component of the XP storm software uses the Laurenson non-linear runoff-routing method to simulate runoff from design storm events. Key assumptions regarding the hydrologic model include:

- Runoff is proportional to slope, area, infiltration and percentage of imperviousness of a catchment.
- Sub-catchment areas and slopes are assumed based on the existing surface;
- Infiltration rates and percentage imperviousness have been selected based on experience with model preparation for similar soil conditions.
- Runoff from each sub-catchment is routed through the catchment using the hydraulic component of XPStorm. Assumptions associated with the hydraulic component of the model include:
- Virtual links (i.e. purely for model construction, not equivalent to flow path onsite) between nodes within a sub-catchment are given the length of 10 m and slope of 0.05 to minimise the lag time of conveying the water from a sub-catchment node to a 'storage' node, a 'dummy intermediate' node or a conduit/link.
- Links between sub-catchment storages act as conveyance channels (e.g. sheet flow within roads in a 100 year ARI event). These links are given lengths and slopes that are representative of the site conditions and actual pathway lengths between catchments.



- All channels are designed with a width of 5 m, roughness of 0.014 (Manning's n) and are trapezoidal in shape. This allows for easy conveyance and represents concrete pipes and road surfaces within the model.
- Bio-retention areas and flood storage areas are modelled as nodal-reservoirs with infiltration depth-rating curves to account for differential infiltration rates with changing depth.
- No ponding conditions have been allowed within 1 year 1 hour ARI storage nodes for events greater than the 1 year 1 hour ARI event.

An "initial loss - continual loss" infiltration model was adopted to represent the post-development environment, with loss values chosen based on project team experience on other projects in the area similar to the site. Table 4 gives the parameters used within the post-development model.

**Table 4 Post Development Parameters**

Land Type	Initial Loss (mm)	Continual Loss (mm)	Roughness
Road Pavement	1	0.1	0.014
Verge	12	2	0.05
Lot Roof	1	0.1	0.014
Lot Garden	25	3.5	0.05
Lot Paved	1	0.1	0.02
POS	20	3	0.05

The infiltration rates used were predominantly based upon the following assumptions:

- Typical lots will be consistent with other new developments in the Perth metropolitan area and have 50% roof areas with the remainder of the lots paved (35%) and pervious garden (15%).
- Residential lots will have little slope (i.e. will be flat) and pockets of storage are likely. This will effectively increase the initial loss (storage) and overall infiltration rate (continual loss).
- Garden areas in all lots will have high infiltration rates as it is likely that sand-based landscape mix or mulch will be used, and will infiltrate 1 year 1 hour ARI event within them.
- POS areas are assumed to be 100% pervious.
- There will be no infiltration on roads, pavements and driveways. There will however be some minor absorption storage loss, this is accounted for in the initial and continuing loss values.
- POS areas will likely contain dense vegetation or turf over a sand-based landscape mix. This turfed area will become compacted over time and reduce initial infiltration rates. It is anticipated that the infiltration losses allowed for in the initial loss and continual loss will be higher than the rate of runoff accumulation from the 1 year 1 hour ARI event.
- Garden areas in all lots will have high infiltration rates as it is likely that sand-based landscape mix or mulch will be used, and will infiltrate the 1 in 1 hours ARI event within them.
- Road reserve contains 60% pervious verge and 40% impervious bitumen.
- The road verge area is similar in characteristics to POS areas except that it will also have an impervious footpath and some driveway crossovers. It is anticipated that the averaged initial loss will be lower than POS initial loss rates.
- The 1 year 1 hour ARI event runoff from road reserves (and some lots as detailed above) will be directed downstream to a bio-retention areas located in POS.
- Surface runoff from events greater than the 1 year 1 hour ARI event, up to the 100 year ARI event will be retained and infiltrated in flood storage areas (FSA).
- A hydraulic conductivity of  $5 \times 10^{-5}$  m/s is assumed for the infiltration of bio-retention areas. A 50% clogging factor has been applied to the assumed infiltration rate.
- A hydraulic conductivity of  $5 \times 10^{-5}$  m/s is assumed for the infiltration in FSAs. No clogging factor has been applied in FSAs.
- The effect of infiltration through side slopes of bio-retention areas and FSAs was considered in the overall infiltration rating curve for these areas. This accounts for infiltration across the entire wetted surface area.
- Volumes leaving the system through evapotranspiration were assumed to be negligible when compared to the total runoff volume and since the duration of model run was comparatively short. XPStorm default evapotranspiration assumptions are therefore used.



### 7.2.1.BIO-RETENTION AREAS (BRAs)

Runoff from the 1 year 1 hour ARI events from road reserves and lots will be captured and retained in a vegetated bio-retention area (BRA) located in the POS.

The BRA will be designed with side slopes no greater than 1:3 and maximum depth of 500mm. The BRA will be densely vegetated with wetland species known for uptake nutrients, thereby excluding access to these areas. BRA inverts will maintain a minimum 300mm clearance from the Maximum Groundwater Level (MGL). Storage requires of the BRA for the 1 year 1 hour event area provided in Table 5, with the associated inundation area shown Table 5.

**Table 5 BRA Parameters**

BRA	Event	Design Detail				
		Depth (m)	Total Impervious area (m2)	Bottom Surface Area(m2)	Surface Area (m2) (inundated areas)	Volume (m3)
BRA1	1 year	0.5	1560	75	180	72m3

Infiltration of runoff through the undertaking soils of the BRA will provide treatment through adsorption nutrients of sand particles. The BRA will also be lined with a high phosphorus retention index (PRI>10) media to improve phosphorus intake. The BRA is sized to cover an area of 4.8% of the total connected impervious area, thus exceeding the 2% of connected impervious area required.

### 7.2.2.FLOOD STORAGE AREA

Flood storage areas (FSAs) will be utilised to infiltrate major event flows in order to maintain the predevelopment hydrological regime. All surface runoff above the 1 year 1 hour event, up to and include the 100 year ARI event, will be retained within FSAs located within the POS area resulting in no off-site discharge.

FSA will be designed with side slopes no greater than 1:6 and an overall maximum depth of 1.0m from bottom of BRA. Storage details of FSAs for the 5 and 10 year ARI are provided in Table 6 with associated inundation area shown.

**Table 6 FSA Parameters**

FSA	Event	Depth (m) to bottom of BRA	Surface Area (m2) (Inundated areas)	Volume (m3) including BRA
FSA 1	5 year	0.748	1193	346
	10 year	0.792	1226	401
	100 year	1.00	1385	673

FSA inverts will maintain a minimum 300mm clearance from the MGL to ensure they are able to adequately drain following a rainfall event. The FSA will also be designed to maintain a 300mm clearance from finished floor levels to the 100 year ARI top water level. Storage details of the FSA for the 100year ARI is provided in Table 6.

## 7.3. NON-STRUCTURAL STORMWATER MANAGEMENT MEASURES

A number of non-structural measures will be implemented across the site to help reduce nutrient loads within stormwater runoff. These measures include:



- Minimising fertiliser use to establish and maintain vegetation within POS areas and road verges;
- Use of drought tolerant turn species that require minimal water and nutrients; and
- Education of residents regarding fertiliser use and nutrient absorbing vegetation species within the lots.

#### 7.4. STORMWATER CRITERIA COMPLAINT SUMMARY

A summary of the proposed stormwater design criteria and how these are addressed for the site are shown in Table 7.

**Table 7 Stormwater Criteria Compliance Summary**

Criteria Number	Description	Manner in which Compliance is Achieved
SW DO1	All runoff up to the 100 year ARI event is to be retained on site	The majority of lots will retain the 1 year 1 hour ARI event on lot in soak wells
		Runoff from road reserve and lots with lot connections will be retained in soakage pits within the pipe network and BRAs within POS areas for events up to the 1 year 1 hour ARI event
		All additional runoff up to the 100 year ARI event will be retained in FSAs within POS areas
SW DO2	Finished floor levels must have a minimum of 300 mm clearance above the 100 year ARI flood levels within road reserve	Finished floor levels will have a minimum clearance of 300 mm from the 100 year ARI flood level in road reserves
SW DO3	Ensure minor roads remain passable in a 5 year ARI event	The pipe network will be sized to convey the 5 year ARI event
SW DO4	Retain and treat the 1 year 1 hour ARI event rainfall as close to source as possible	Bio retention basin areas will be used to treat and infiltrate The 1 year 1 hour ARI event
SW DO5	Reduce nutrient loads by applying appropriate non-structural measures	Education of residents regarding WWG, fertiliser use and nutrient absorbing vegetation species within lots
		Minimising fertiliser use to establish and maintain vegetation within POS areas and road verges
		Use of WWG in POS and road verges

## 8. GROUNDWATER MANAGEMENT STRATEGY

### 8.1. GROUNDWATER LEVELS AND FILL

Construction of housing generally requires a minimum clearance of 1.2m between the highest known groundwater table and the foundations. This clearance is present in all bores with the exception of WM1 & WM2

However due the entire drainage from the site draining to the POS area, it is proposed that the base of the bio-retention area is at or above the minimum groundwater level. This has resulted in the majority of the site being raised approximately 700mm.

This raising of each pad 700mm has resulted in the distance from groundwater to the house pads to be greater than 1.5m. Subsequently it is not required to have any subsoil drainage in this project.



## 8.2. GROUNDWATER QUALITY MANAGEMENT

In terms of managing groundwater quality, the primary goals of the development should be to minimise fertiliser use and ensure that stormwater receives treatment prior to infiltration. Drainage structures will not be fertilised. Where households are responsible for their own garden maintenance, advice should be provided on minimising fertiliser and water use in the garden at settlement.

## 8.3. MATTERS TO BE ADDRESSED IN THE UWMP

The UWMP should show the design of the subsoil drainage system and results of any further groundwater monitoring.

## 9. THE NEXT STAGE – SUBDIVISION AND URBAN WATER MANAGEMENT PLAN

### 9.1. MATTERS TO BE ADDRESSED IN THE UWMP

The UWMP should address:

- Detailed drainage design
- Details of the proposed Hampton Road swale and how the drainage design will interact with the swale
- Show the design of the subsoil drainage system;
- Show the results of any further groundwater monitoring; and determine the post development monitoring plan.

## 10. MONITORING

### 10.1. RECOMMENDED PROGRAM FOR UWMP

Groundwater will be monitored until the UWMP is submitted. Groundwater levels should be monitored monthly on the site. Groundwater quality monitoring should be conducted quarterly at the Bores MW1 and MW2.

### 10.2. RECOMMENDED PROGRAM POST -DEVELOPMENT

The post development monitoring plan will be developed as part of the Urban Water Management Plan.

## 11. IMPLEMENTATION PLAN

### 11.1. ROLES AND RESPONSIBILITIES

Table 8 Stakeholder Responsibility for Maintenance

Item	Scheme Development	Interim Maintenance (First 12 Months)	Long-Term Maintenance
Waterwise Fittings	Developer/Council	Residents	Residents
Drainage Systems	Developer	Developer, as per council requirements	Council
Monitoring of the Development	Developer	Developer	Council

### 11.2. FUNDING

No external Funding has been sought for this project.



## Appendix A – Conceptual Drainage Design



## Appendix B – Bore Logs



## Appendix C – Geotechnical Report



## Appendix D – XP Storm Results





# LOCAL WATER MANAGEMENT STRATEGY

## Addendum 1.

**CORKAR PTY LTD**

**L9001 HAMPTON ROAD PINJARRA**

Project -							
Rev	Description	Orig	Review	Structerre approval	Date	Client Approval	Date
A	RFI response	FV	RL		07/10/16		



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## EXECUTIVE SUMMARY

This is an addendum to the Local Water Management Strategy (LWMS) (reference Document Number: 45294-16CH-RO1 (D)) prepared by Structerre to support the Outline Development Plan (ODP) for L9001 (Formally Lot 41) Hampton Road, Pinjarra (the subject site).

The purpose of this addendum is to address three points of concern raised by the Shire of Murray in their email dated 16 September 2016. A copy of the email is attached hereto marked as Attachment A. Since contents of this addendum are conceptual only, engineering design details will be provided at engineering design stage.



## 1. 100 YEAR BASIN TO BE WITHIN THE POS

### 1.1. BACKGROUND

The original proposal in the LWMS (see SW Design Objective 1) is to accommodate all of the 100 year ARI event within the development site, namely in the top north east corner, accommodating a base area of 1017m<sup>2</sup>, however, this would require containment of the 100 year flood event within the confines of retaining walls with the resultant loss public amenity and of vegetation, namely trees growing within the proposed public open space (POS) which provide shade, shelter and provides habitat. The effect of the retaining walls would impede pedestrian access within and through the POS.

The intent of the POS for this development is to incorporate the adjacent Humphrey Park thereby forming a more usable open space. The Shire of Murray has since proposed the developer incorporate the 100 year ARI of the development within the adjacent Humphrey Park, thereby minimising the loss of trees and improve the public amenity of the combined POS of Humphrey Park and that dedicated by the developer. The combining of the open space and incorporating the flood storage within the combine space has a more beneficial public outcome, the flood storage can be incorporated by good design into the open space, without its purpose being obvious.

### 1.2. DESIGN

It is planned that most of the sites overland flow will be in an easterly, north easterly direction generally within the proposed road reserve. This will be achieved by importing fill to shape the site accordingly.

The easterly overland flows will enter the POS in the north east corner of the site. It was intended that the flood storage be solely within this POS, however, with the Shire of Murrays suggestion, we recommend that the storage could be within the adjoining parkland. Conveyance of flows through this POS towards Humphrey Park will be contained within the POS by construction of low unobtrusive embankments that do not require removal of any trees. Detailed ground survey and tree survey will dictate the design of the shape, and height of these banks.

It is anticipated that approximately 1.4m of lot fill will be required in the final engineering design to ensure sufficient grade for the conveyance of overland flow from the site. The design would be in accordance with Council design requirements.

From the LWMS Table 6 Flood Storage Area (FSA) Parameters, provides for the storage volumes for the various flood conditions. It can be seen that excluding the bio-retention area (BRA), we require flood storage for 601m<sup>3</sup>. We suggest that these two activities, flood storage and Bio-retention basin area, be treated separately in separate locations

Table 1.2 below provides for flood storage independent of the bio-retention basin, this assumes the bio retention is independent of the flood storage.



Table 1.2

Flood Storage Areas (FSA)	Event	Volume (m3) excluding BRA Volume
	5 year ARI	274m3
	10 year ARI	329m3
	100 year ARI	601m3

Utilising the POS for flood storage and allowing for an embankment or depression of 200mm, we would require FSA of approximately 3000m<sup>2</sup>. The 200mm flood depth is safe and can be easily lost by shaping the site making its “storage” purpose inconspicuous. Our modelling indicates that the calculated storage volume is sufficient for the various rainfall events without taking into account the high infiltration rate of the underling ground conditions.

Detailed design will be required to identify the best, most practical location and providing the best amenity of the flood storage footprint, so that the combined POS can be used as active open space with appropriate design features. Those area untouched can be developed into very effective passive spaces.

The Shire of Murray will include these development condition for the utilisation of the combined POS in the development application phase and the designs will be carried out at engineering design stage.

Attachment 1 provides a conceptual location and sizing for both the flood storage and bio-retention. Final shape and the most suitable location will be considered during engineering design.

## 2. DRAINAGE TREATMENT IN HAMPTON ROAD

Even though less than 8% of the overland flow flows to the west to Hampton Road we recommend some treatment of the overland flow within a bio-retention basin

For practical reasons and for ease of construction, ensuring the BRA is unobtrusive and yet practical, we suggest the bio-retention basin be located within the footpath verge.

It may be constructed such that the vegetation within the basin hides the basin and becomes an asset rather than a liability. This is common practise in all others states of Australia.

### 2.1. BIO RETENTION BASIN SIZING

Adopting the same design parameters of the LWMS for bio retention basins and for the basin in the north east of the site, the required sizing is as below.



Table 2.1

BRA 2	Event	Depth (m) to bottom of BRA	Volume (m3)
	1 year	0.5	5.76m3

As sustainable size which can be incorporated within the footpath verge is 1.45m (W) x 10m (L) x 0.4m (D).

This minimum depth will allow ease of overland flow entry into the basin.

Detailed design shall be carried out at engineering design stage.

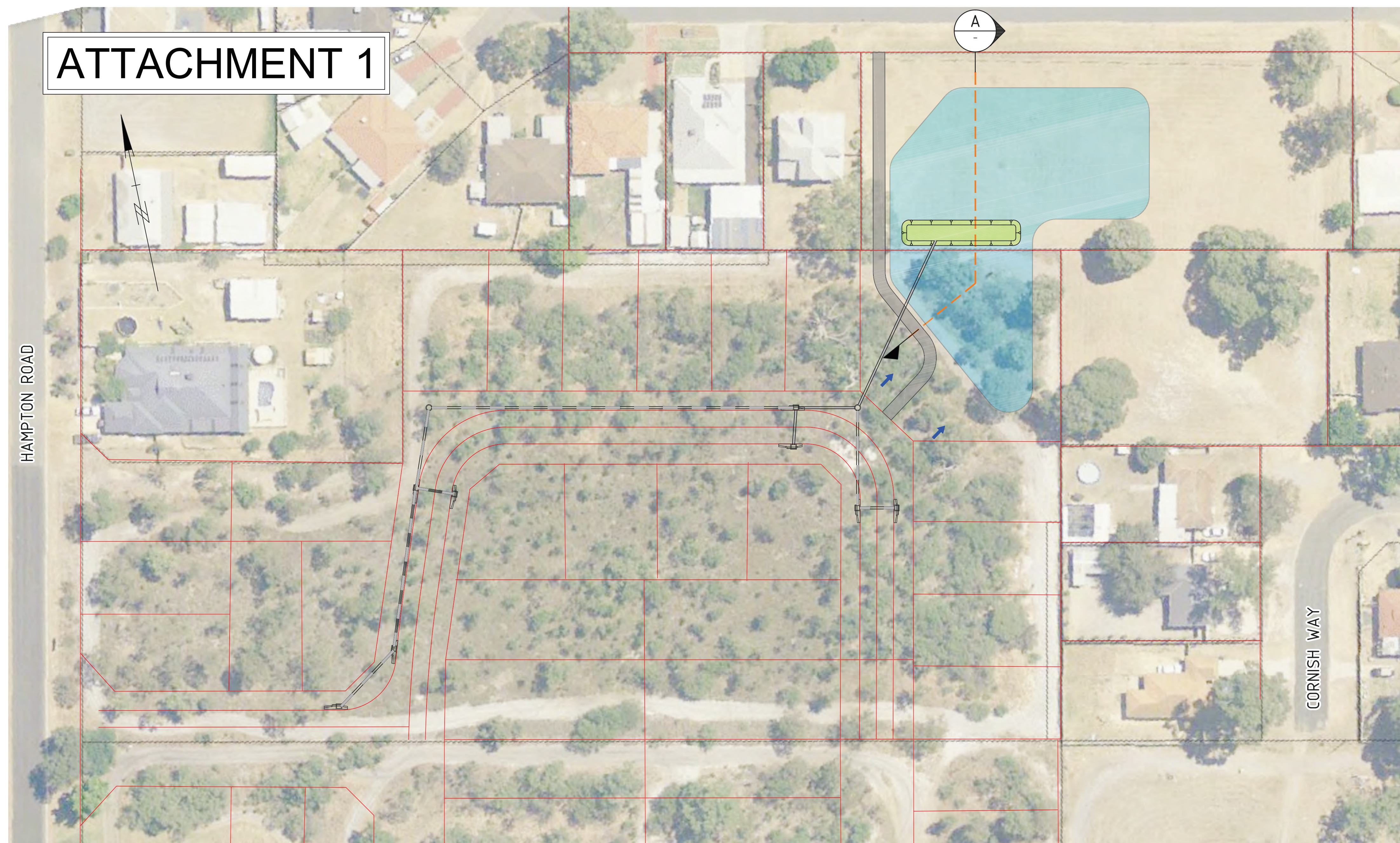
### 3. GROUND WATER MONITORING

Further to the objectives and recommendation of the LWMS (conceptual), there is a groundwater dependant threatened ecological community in the conservation category wetland to the west of the development. As such the Urban Water Management Plan stage will require the inclusion of monitoring and contingency plans to ensure that the development does not alter the hydrological regime to the detriment of this habitat.

The UWMP prepared for Lot 43 and 50 that was approved by DoW and Council in 2007 needs to reflect the groundwater dependency of the ecological community.



# ATTACHMENT 1



HAMPTON ROAD

YAN HSIANG-YU

LEGEND:



STORMWATER MANHOLE



## STORMWATER SIDE ENTRY PITS



STORMWATER PIPE



OVERLAND FLOW PATH



CONCRETE FOOTPATH



BIO BASIN  
(BIO BASIN SIZE USED = 75M2)

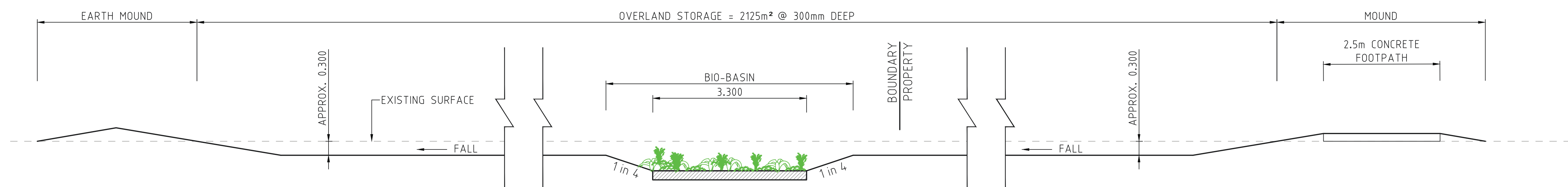
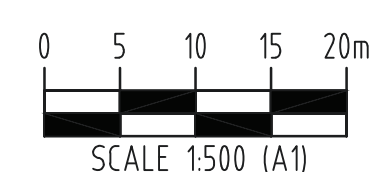


FLOOD STORAGE BASIN  
(2125m<sup>2</sup> x 0.300deep=368m<sup>3</sup>)

NOTE

TREE REMOVAL SUBJECT TO  
ENGINEERING DESIGN APPROVAL.

## LAYOUT



SECTION

SCALE 1 : 50



PRELIMINARY ISSUE  
NOT FOR CONSTRUCTION

[illegible]





# APPENDIX 4

BUSHFIRE MANAGEMENT PLAN



ROWEGROUP



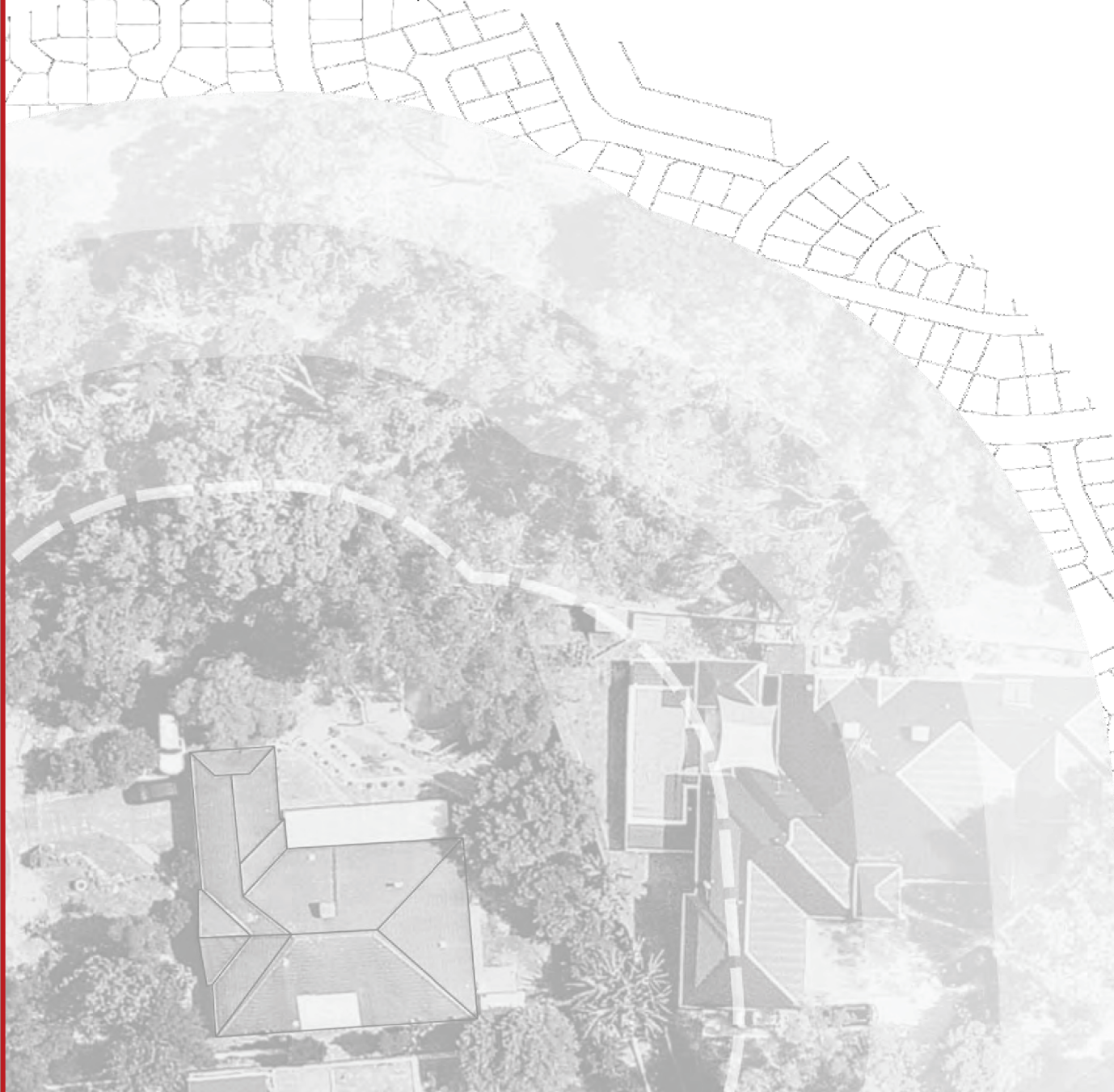


# BUSHFIRE MANAGEMENT PLAN

Subdivision Application

Lots 42 & 9001, Hampton Road, Pinjarra

Version: 1.2 Reference: 5049 September 2016





**Project Number:** 5049  
**Project Name:** Lots 42 & 9001 Hampton Road, Pinjarra  
**Author:** Erika Dawson, Grad Dip Bushfire Protection  
**Approved by:** Darrel Krammer, Grad Cert Bushfire Protection, BPAD33412, Level 1  
**Version:** 1.2 Final RELEASE  
**Date of issue:** 16<sup>th</sup> September 2016

A handwritten signature in black ink, appearing to read "Erika Dawson", positioned above a horizontal line.

Author:  
Date: 9/6/2016

A handwritten signature in black ink, appearing to read "Darrel Krammer", positioned above a horizontal line.

Approved by:  
Date: 16/09/2016

In the signing the above, the author declares that this Bushfire Management Plan meets the requirements of State Planning Policy 3.7. This report supersedes all previous Bushfire Management Plans for the site.



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This report is prepared solely for **Karl ter Horst** (the 'proponent') and any future landowners of the subject lot(s) and is not for the benefit of any other person and may not be relied upon by any other person.

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ABN: 48 151 451 713



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## 1.0 Introduction

### 1.1 Subject Site

The site the subject of this Bushfire Management Plan (BMP) comprises Lots 42 & 9001 Hampton Road, Pinjarra. The site is located within the municipality of the Shire of Murray. Figure 1A illustrates the subject site and its immediate surrounds.

The site is identified as being Bushfire Prone on the State Bushfire Prone Maps.

The proponent has not identified any relevant environmental considerations (wetlands, foreshores, Bush Forever sites, remnant vegetation, threatened species, ecological communities, nature reserves or coastal reserves) within the site or being affected by the development.

### 1.2 Development Description

The development proposes the subdivision of Lots 42 and 9001 into 57 residential lots plus two lots for Public Open Space (the development). The proposed development is illustrated in Figure 1B.

The Western Australian Planning Commission (WAPC) has requested that the subdivision be assessed in two scenarios:

1. Lot 42 Hampton Road being subdivided by itself and Lot 9001 not being subdivided; and
2. Both Lots 42 and 9001 being subdivided at the same time.

This report has therefore been prepared to address both scenarios 1 and 2.

### 1.3 Previous Bushfire Assessments

There are no known previous bushfire assessments that have been undertaken for the site.





5049\_001\_01\_BaseMap\_201\_60202  
Projection: GDA94 MGA50  
Author: MW - RUIC | Date: 2016-05-03  
Data Source: Cadastre - Landgate; Imagery - Nearmap;  
Roads: Site Boundary - RUIC,  
Disclaimer: Although the data within this map is considered  
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completeness of any data used within this map.

Size: A4  
Scale: 1:2,800  
0 20 40 60 80 100 m

Site Boundary  
Cadastre  
Main Road

**BUSHFIRE MANAGEMENT PLAN MAP**  
**Lot 42 and 9001 Hampton Road, Pinjarra**

  
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**Site Overview**

Figure 1A: Site Overview



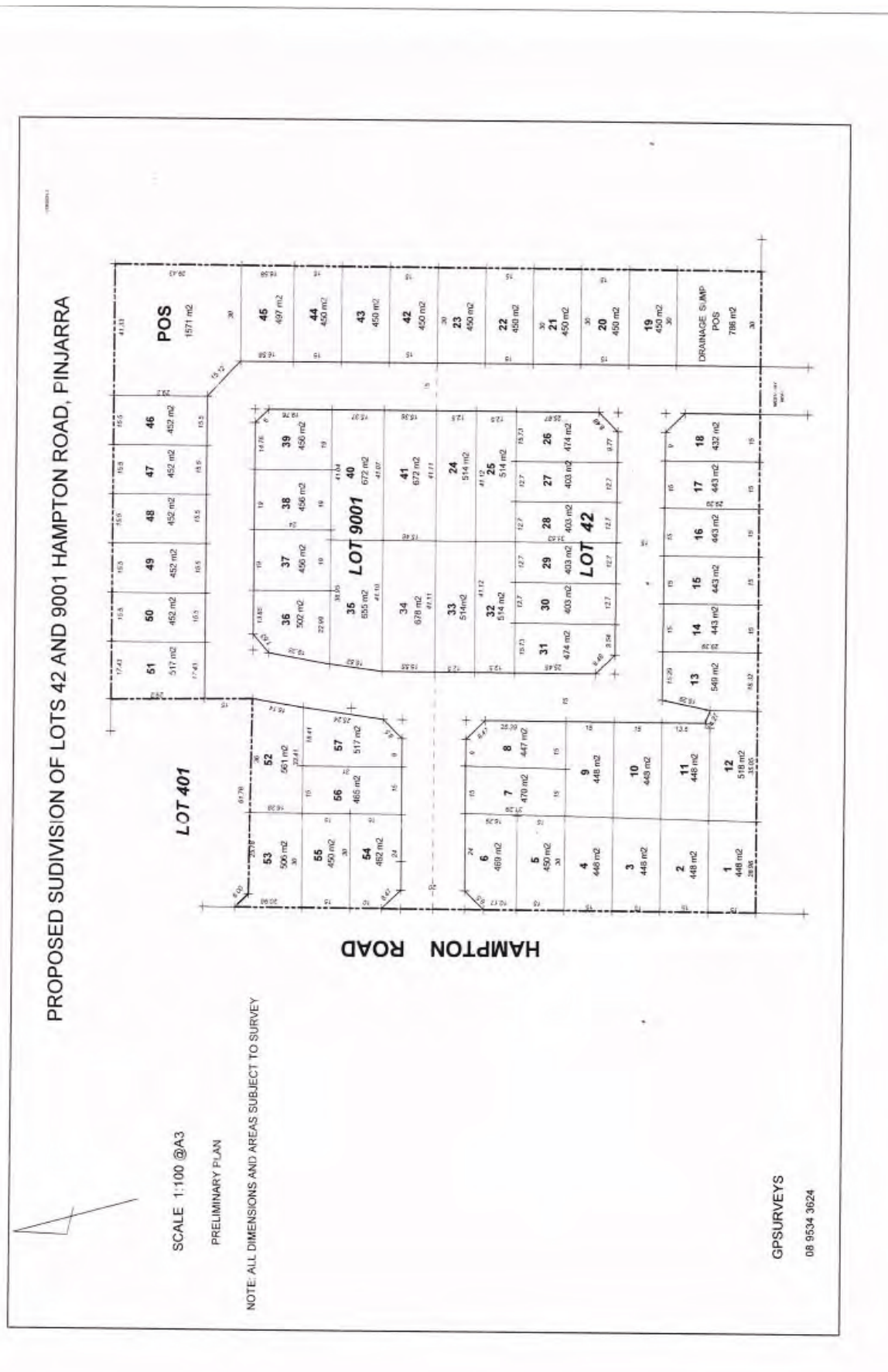


Figure 1B: Development Plan



## 2.0 Spatial consideration of bushfire threat

### 2.1 Bushfire Fuels and Potential Bushfire Impact

The location and extent of AS 3959 vegetation structures, including clause 2.2.3.2 low threat exclusions, within 100m of the site are mapped in Figure 2A and illustrated in the associated plates. Bushfire fuel loads are identified as consistent with AS 3959 Table B2 for radiant heat flux modelling purposes. All bushfire structures and fuel loads are assessed in their mature states (including revegetation and rehabilitation areas) unless otherwise identified.

All vegetation on site will be removed as part of the subdivision development. If the subdivision is staged, all vegetation within 100m of residential lots will be reduced to low threat vegetation. Public Open Space lots will be managed as low threat vegetation in accordance with AS3959 clause 2.2.3.2(f).



Plate i: Plot 1 Exclusion 2.2.3.2(f)



Plate ii: Plot 1 Exclusion 2.2.3.2(f)



Plate iii: Plot 2 Class G Grassland



Plate iv: Plot 2 Class G Grassland





*Plate v: Plot 3 Class B Woodland*



*Plate vi: Plot 4 Class B Woodland*



*Plate vii: Plot 4 Class G Grassland*



*Plate viii: Plot 4 Class G Grassland*



*Plate ix: Plot 5 Class D Scrub*



*Plate x: Plot 5 Class D Scrub*





Plate xi: Plot 6 Exclusion 2.2.3.2(e)



Plate xii: Plot 6 Exclusion 2.2.3.2(e)



Plate xiii: Plot 7 Exclusion 2.2.3.2(e)



Plate xiv: Plot 7 Exclusion 2.2.3.2(e)



Plate xv: Plot 8 Class D Scrub



Plate xvi: Plot 8 Class D Scrub

Plot 6 is managed in a Low Threat fuel state that meets the AS3959-2009 exclusion 2.2.3.2 (f), as confirmed by the Shire of Murray (Appendix A).



The following table outlines the worst case BAL for each of the Plots based separation distance to the external property boundary of Lots 42 and 9001.

Table 2A: Maximum BAL rating that applies to the site

Plot	Vegetation Classification	Effective Slope	Separation (m)	BAL Rating
1	Exclusion 2.2.3.2(f)	N/A	N/A	N/A
2	Class G Grassland	Flat	3m*	BAL-FZ
3	Class B Woodland	Flat	17m	BAL-29
4	Class G Grassland	Flat	19m	BAL-12.5
5	Class D Scrub	Flat	80m	BAL-29
6	Exclusion 2.2.3.2(e)	N/A	N/A	N/A
7	Exclusion 2.2.3.2(e)	N/A	N/A	N/A
8	Class D Scrub	Flat	3m*	BAL-FZ
Notes:				
* Assumes minimum separation of 3m wide firebreak as it currently exists				

Potential bushfire impact analysis was undertaken in accordance with AS 3959 Methodology 1 to determine the potential worst case scenario radiant heat impact on each of the lots in the proposed subdivision. In accordance with SPP 3.7, a BAL Contour Map has been prepared to illustrate the potential radiant heat impacts and associated BAL ratings for the assessment area after the development is completed. Two development scenarios have been considered:

- Scenario 1 – development only of Lot 42 (Figure 2A); and
- Scenario 2 – development of Lot 42 and Lot 9001 (Figures 2B to 2D).

For Scenario 1, a temporary 20m wide low fuel Hazard Separation area would be installed adjacent to the northern boundary of Lot 42 and maintained until such a time as Lot 9001 is developed. This Hazard Separation area would cover Lots 6-8, 22-25 and 32 & 33 and as such these lots would remain as balance title lot(s) until such a time as Lot 9001 is developed. The existing 3m wide firebreak within Lot 9001 is included in setback distances. The developer is responsible for the establishment and ongoing maintenance of the Hazard Separation area, to the same standards as an Asset Protection Zone and grassland <10cm in accordance with AS3959 clause 2.2.3.2 (f).

For both Scenarios 1 and 2, a 5m wide APZ is to be installed adjacent to the eastern boundary of Lots 19 to 23 and Lot 42, until such a time as the grassland within the adjoining Lot 51 McLarty Rd is permanently removed.



Table 2B: Maximum BAL rating that applies to each lot

Lot	Initial BAL	Asset Protection Zone/Hazard Separation	Revised BAL
<b>Scenario 1 (Refer to Figure 2A)</b>			
6 -8, 22-25, 32 & 33		Comprise the 20m Hazard Separation and remain as balance title lot until Lot 9001 is developed	N/A
1-5	BAL-29	-	BAL-29
9-18, 26-31	BAL-12.5	-	BAL-12.5
19-21	BAL-40	5m APZ adjacent to eastern boundary	BAL-29
<b>Scenario 2 (Refer to Figures 2B, 2C &amp; 2D)</b>			
1-6	BAL-29	-	BAL-29
7-13, 31-36, 43-44, 51-52, 56-57	BAL-12.5	-	BAL-12.5
19-21	BAL-40	5m APZ adjacent to eastern boundary	BAL-29
22-23,	BAL-FZ	5m APZ adjacent to eastern boundary	BAL-29
42, 53-55	BAL-19	-	BAL-19
14-18, 24-30, 37-41, 45-50	BAL-LOW	-	BAL-LOW

From the above it can be seen that, for both Scenarios 1 and 2, all proposed lots would achieve BAL-29 or less with the implementation of the bushfire management strategies (i.e. APZ or Hazard Separation). The BALs for some of the lots could be further reduced subject to building setbacks.

## 2.2 Bushfire Hazard Issues

From the BAL Contour Map, the following bushfire hazard issues have been identified.

- Lots 6 -8, 22-25, 32 & 33 will remain as balance title lots and provide a Hazard Separation until such a time as Lot 9001 is developed.
- Lots 19 to 23 and Lot 42 are subject to a BAL-40 or BAL-FZ radiant heat impact. An APZ needs to be installed adjacent to the eastern boundary of these lots, within a minimum width of 5 m, to reduce the BAL to BAL-29. This is addressed in Section 4 of this report.
- Secondary access during Stage 1 is to be provided by a temporary public road west through the Hazard Separation area to Hampton Rd, and maintained until Lot 9001 is developed.
- The BAL Contour assessment is indicative, subject to all subdivision works being completed to the design standards of this BMP. A post subdivision construction BAL Contour Map, or individual lot BAL assessment (prior to building permit) is required to confirm actual lot BAL ratings post subdivision.



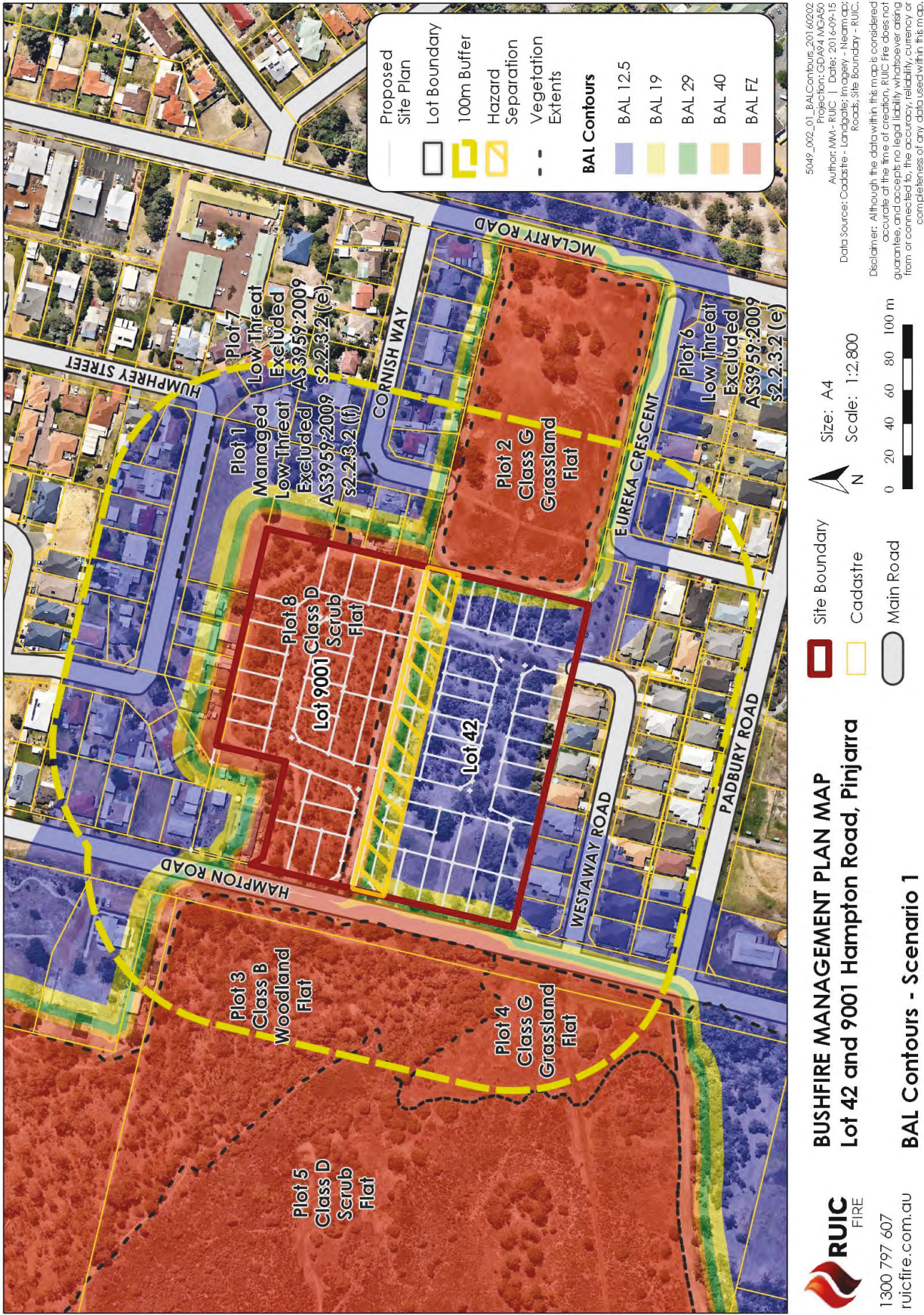


Figure 2A: Scenario 1 Overall BAL Contour Map



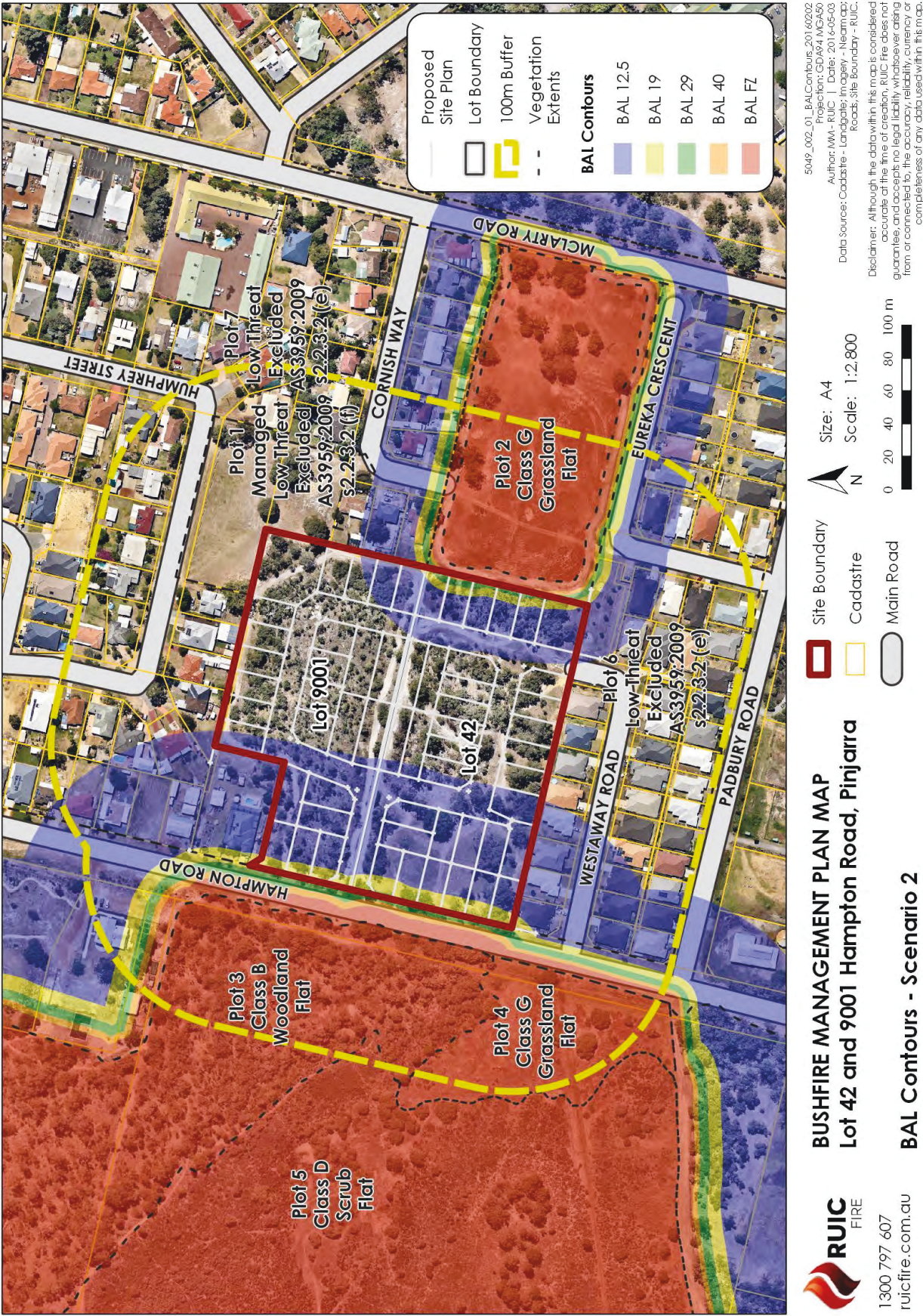


Figure 2B: Scenario 2 Overall BAL Contour Map





Figure 2C: Scenario 2 BAL Contour Map (Northern Section)



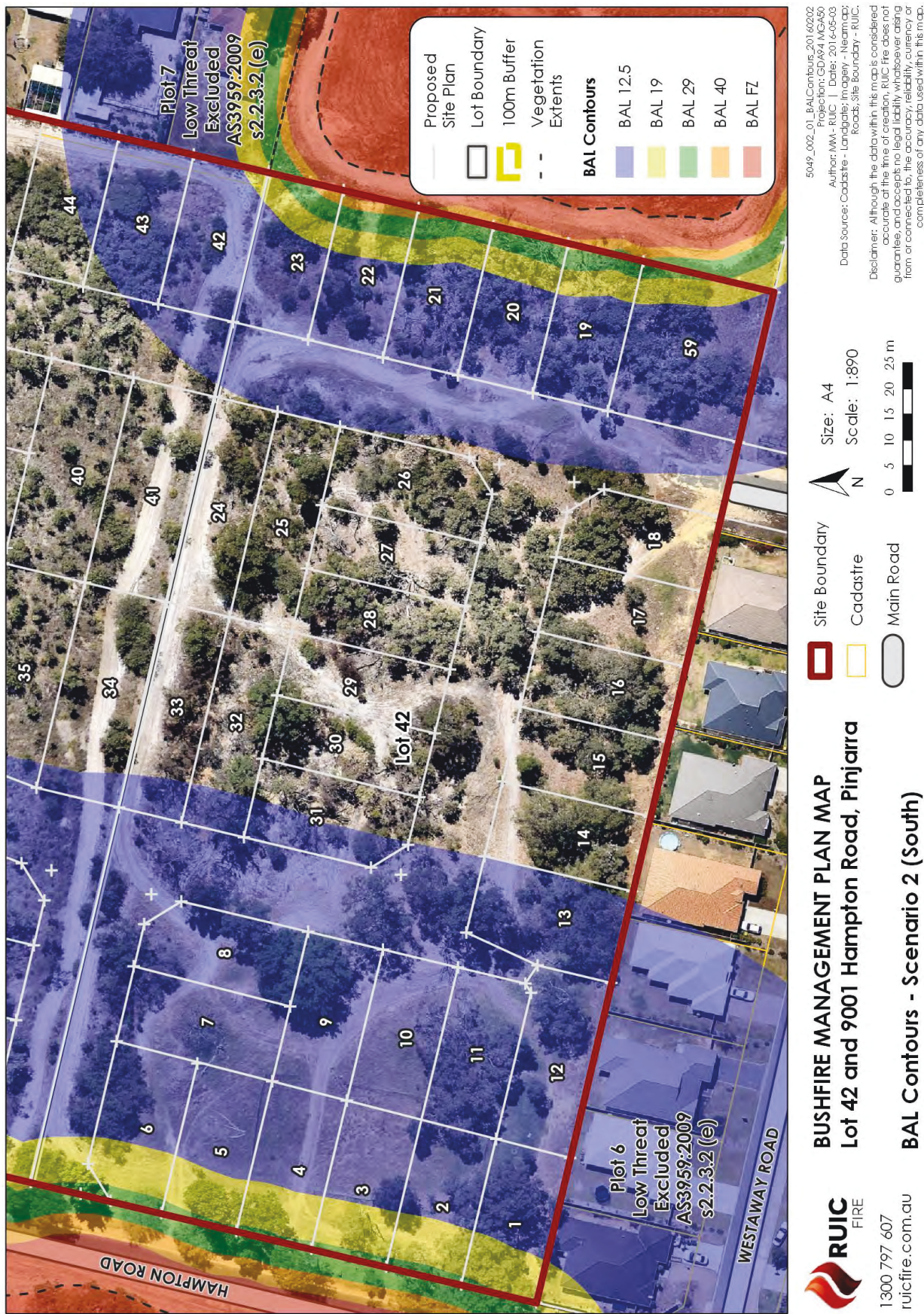


Figure 2D: Scenario 2 BAL Contour Map (Southern Section)



## 3.0 Proposal compliance and justification

### 3.1 State Planning Policy 3.7 – Planning in Bushfire Prone Areas (SPP 3.7)

SPP3.7 applies to all subdivision applications in designated bushfire prone areas.

#### 3.1.1 Objectives

Policy Measure 5 contains the objectives of SPP3.7. The following demonstrates how the proposed development meets each of the objectives.

**Objective 1:** *Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount.*

#### Development Response

Objective 1 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed below and all GPBPA Performance Principles as detailed in Section 4 of this report.

**Objective 2:** *Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.*

#### Development Response

Objective 2 is satisfied through the appropriate identification and assessment of all relevant bushfire hazards as detailed in section 2 of this report, specifically the BAL Contour Mapping.

**Objective 3:** *Ensure that higher order strategic planning documents, strategic planning proposals, subdivision and development applications take into account bushfire protection requirements and include specified bushfire protection measures.*

#### Development Response

Objective 3 is satisfied through the compliance of the proposed development with all required Policy Principles as detailed below and all GPBPA Performance Principles as detailed in Section 4 of this report.

**Objective 4:** *Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.*

#### Development Response

Objective 4 is satisfied through the appropriate consideration of all biodiversity and environmental assets as detailed in section 1 of this report in the development of bushfire related risk mitigation strategies detailed in section 4 of this report.

#### 3.1.2 Policy Measures

##### 3.1.2.1 Subdivision Applications

Policy Measure 6.2 requires that subdivision applications within designated bushfire prone areas and that have a BAL above BAL-LOW are to comply with Policy Measure 6.4.

##### 3.1.2.2 Information to Accompany Subdivision Applications

Policy Measure 6.4 applies to subdivision applications. It requires certain information to be provided with such applications. The following outlines where the required information has been provided.



Table 3A: Compliance of the proposed development with the Policy Measures of SPP 3.7.

Policy Measure	Description	Development Response
a	A BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. BAL Contour Maps should be prepared by an accredited Bushfire Planning Practitioner	Figures 2A-2D provides the BAL Contour Maps.
b	The identification of any bushfire hazard issues arising from the BAL Contour Map;	Section 2.2 addresses the bushfire hazard issues.
c	An assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance within the boundary of the subdivision site.	Section 4 provides an assessment of the development against the bushfire protection criteria.

### 3.1.2.3 Vulnerable or High Risk Land Uses

The proposed subdivision does not contain any vulnerable or high risk land uses.

### 3.1.2.4 Applications in BAL-40/BAL-FZ Areas

On completion of development, the developable land would not be subject to BAL-40 or BAL-FZ as outlined in Section 2.1.

### 3.1.2.5 Advice of State/Relevant Authority/s for Emergency Services to be Sought

The proposed subdivision:

- Complies with the SPP3.7 Policy measures;
- Does not propose any additional/alternative measures; and
- Does not contain unavoidable development, vulnerable or high risk land uses.

Therefore, the advice of State/Relevant Authorities for Emergency Services is not required to be sought for this application.

### 3.1.2.6 Advice of State/Relevant Agencies/Authorities for Environmental Protection to be Sought

The proposed subdivision:

- Is not known to propose clearing of vegetation within environmentally sensitive areas protected under State or Federal legislation;
- Is not known to propose clearing of locally significant native vegetation; and
- Does not abut vegetated land managed by that authority.

Therefore, the advice of State/Relevant Agencies/Authorities for Environmental Protection is not required to be sought for this application.



---

### **3.2 Guidelines for Planning in Bushfire Prone Areas (Guidelines)**

The Guidelines apply to subdivision applications located within designated bushfire prone areas. The Guidelines provide supporting information for implementation of SPP3.7. Specifically, they provide the Bushfire Protection Criteria to be address for all applications.

This report has also been developed in order to comply with the requirements of all referenced and applicable documents. No non-compliances have been identified.



## 4.0 Bushfire Risk Management Measures

The bush fire risk mitigation strategies detailed in this report are designed to comply with the Bushfire Protection Criteria detailed in *Guidelines for Planning in Bushfire Prone Areas* (GPBPA) Appendix 4 (2015).

- i. The notation (P3) refers to Performance Principle 3 of GPBPA Appendix 4.
- ii. The notation (A3.1) refers to Acceptable Solution 3.1 of GPBPA Appendix 4.
- iii. The notation (E3.1) refers to Explanatory Note 3.1 of GPBPA Appendix 4.
- iv. Where discrepancy occurs between State and Local bushfire planning provisions the higher standard of mitigation has been selected.

### 4.1 Element 1 - Location

**Intent:** To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure.

**Performance Principle (P1):** The strategic planning proposal, subdivision and development application is located in an area where the bushfire hazard assessment is or will, on completion, be moderate or low, or a BAL-29 or below, and the risk can be managed. For minor or 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 Solution A1.1      Development location**

The strategic planning proposal, subdivision and development application is located in an area that on completion will be subject to a BAL-29 or below for all habitable buildings.

#### **Development Response/Recommendations**

As outlined in Figures 2A to 2D and Table 2B, the subdivision would ensure all future habitable buildings are, upon completion of development, located in an area subject to BAL-29 or lower. Development within Lot 51 McLarty Rd, that removes all classified Class G Grassland vegetation will reduce the BAL ratings to BAL-LOW.

Based on the current firebreak located within Lot 51 McLarty Rd, Lots 19 to 23 and Lot 42 would require a 3.5m wide APZ adjacent to their eastern boundary to achieve a BAL-29. As a precautionary measure, this APZ has been extended to 5m, measured from the rear lot boundary of each lot.

### 4.2 Element 2 - Siting and design of Development

**Intent:** To ensure that the siting of development minimises the level of bushfire impact.

**Performance Principle (P2):** The siting and design of the strategic planning proposal, subdivision or development application, including roads, paths and landscaping, is appropriate to the level of bushfire threat that applies to the site. That it minimises the bushfire risk to people, property and infrastructure, including compliance with AS 3959 if appropriate.



**Acceptable Solution A2.1      Asset Protection Zone (APZ)**

Every building is surrounded by an Asset Protection Zone (APZ), depicted on submitted plans, which meets the following requirements:

- a. Width: 20 metres measured from any external wall of the building or building envelope. Where the slope increases above 10 degrees, the APZ should be increased to ensure the potential radiant heat impact of a fire does not exceed  $29\text{kW/m}^2$ . Where a full 20 metre APZ is not possible, the APZ should be sufficient enough to ensure the potential radiant heat impact of a fire does not exceed  $29\text{kW/m}^2$
- b. Location: within the boundaries of the lot on which the building is situated;
- c. Fine fuel load: reduced to and maintained at 2 tonnes per hectare;
- d. Trees (crowns) are a minimum distance of ten metres apart. A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species;
- e. No tall shrubs or trees located within 2 metres of a building;
- f. No tree crowns overhanging the building;
- g. Fences and sheds within APZ are constructed using non-combustible materials (eg. iron, brick, limestone, metal post and wire); and
- h. Sheds within the APZ should not contain flammable materials.

**Development Response/Recommendations**

The Asset Protection Zone (APZ) is a low fuel area immediately surrounding a building and is designed to minimise the likelihood of flame contact with buildings.

Features such as driveways, footpaths, roads, vegetable patches, lawn or landscaped garden (including deciduous trees and fire resistant plant species) may form part of asset protection zones. Areas of vegetation deemed Low Threat Vegetation and managed in a reduced fuel state inclusive of Public Open Space and nature strips may form part of a buildings defensible space. Isolated shrubs and trees may be retained within asset protection zones.

The APZs proposed as part of this subdivision development are illustrated in Figure 4A. Specifically:

- For Scenario 1, a temporary 20m wide Hazard Separation area, established and maintained to the standards of an APZ and grassland <10cm in accordance with AS3959-2009 clause 2.2.3.2 (f), located on Lot 42 adjacent to the northern boundary and maintained until such a time as Lot 9001 is developed. The Hazard Separation area covers Lots 6-8, 22-25, 32 & 33.
- For both Scenarios 1 and 2, a 5m wide APZ located on Lots 19 to 23 adjacent to the eastern boundary, until such a time that the unmanaged grassland vegetation with Lot 51 McLarty Rd is permanently removed. This will provide a maximum  $29\text{kW/m}^2$  for the developable area of these lots.
- The Hampton Road road reserve provides the Hazard Separation for the western most lots. As shown on Figures 2A to 2D, the lots abutting Hampton Road will achieve a BAL-29 level or lower.

**Implementation**

- i. APZs and Hazard Separation areas to be implemented prior to the clearance of subdivision for affected lots in accordance with Figure 4A and provisions c-h above.
- ii. It is the responsibility of the developer to ensure the APZ and Hazard Separation area standard is established.



- iii. It is the responsibility of the individual property owner to ensure the APZ standard continues to be achieved post completion of the construction, and the developer for the Hazard Separation area until development within Lot 9001 Hampton is cleared and developed.

**Acceptable Solution A2.2 Hazard separation zone (HSZ)**

Every building and its contiguous APZ is surrounded by a Hazard Separation Zone (HSZ), depicted on submitted plans, that meets the following requirements:

- a. Minimum width: 80 metres, measured from the outer edge of the APZ, for any vegetation classified in AS 3959 as forests, woodlands, closed shrub, open shrub, mallee/mulga and rainforest; OR 30 metres, measured from the outer edge of the APZ, for unmanaged grassland;
- b. Location: within the boundaries of the lot on which the building is situated or, where this is not possible or desirable, within the boundaries of the development precinct in which the building is proposed to be located; and
- c. Fine Fuel load (Dead Material <6mm diameter and <3mm for live material): reduced to and maintained at between five and eight tonnes per hectare for jarrah/marri dominated forest and woodlands, below 12-15 tonnes per hectare in mallee heath and below 15 tonnes per hectare in karri forest.

Note: A HSZ may not be required if the proposed construction meets the standard appropriate to the BAL for that location, and does not exceed BAL-29.

**Development Response/Recommendations**

With the implementation of the bushfire management strategies (i.e. Hazard Separation and APZ), no BAL on site will exceed BAL-29 post development. Construction standards will be applied to relevant buildings in accordance with AS3959 as part of the Building Permit. In this regard a HSZ is not required for this subdivision.





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 Project: CD924 MC450  
 Author: MW - RUIC  
 Date: 2016-02-16  
 Data Source: Cadastre - Landlines Imagery - Neomaps  
 Roads, Site Boundary - RUIC

Disclaimer: Although the data within this map is considered accurate at the time of creation, RUIC Fire does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any data used within this map.

Size: A4  
 Scale: 1:2,800

0 20 40 60 80 100 m

Site Boundary  
 Cadastre  
 Main Road

**BUSHFIRE MANAGEMENT PLAN MAP**  
**Lot 42 and 9001 Hampton Road, Pinjarra**  
**Bushfire Management Strategies**

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Figure 4A: Bushfire Management Strategies Map



### 4.3 Element 3 - Vehicular Access

**Intent:** To ensure that the vehicular access serving a subdivision/ development is safe in the event of a bush fire occurring.

**Performance Principle (P3):** The internal layout, design and construction of public and private vehicular access in the subdivision/development allows emergency and other vehicles to move through it easily and safely at all times.

<b>Solution</b>	<b>AS</b>	<b>PS</b>	<b>N/A</b>	<b>Comment</b>
A3.1 Two access routes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A3.2 Public road	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A3.3 Cul-de-sac (including a dead-end road)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
A3.4 Battle-axe	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
A3.5 Private Driveway longer than 50 metres	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
A3.6 Emergency Access Way	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
A3.7 Fire Service Access Routes	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
A3.8 Firebreak width	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

#### **Acceptable Solution 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.

#### **Development Response/Recommendations**

Figures 4A & 4B illustrate access available to the site during each scenario and to the greater area. The development achieves at least two different vehicular access routes, both connecting to the public road network (to Hampton Road and Westaway Road) to provide egress to two different destinations at all times, including during staging of the subdivision.

For Scenario 1, access is provided via the internal road network and Westaway Rd to Hampton Rd. Additional access to Hampton Road will be via a temporary public road through the Hazard Separation area, west to Hampton road.

For Scenario 2, access will be provided west to Hampton Rd via the constructed 20m wide public road reserve at the junction of Lots 42 and 9001, and additional access to Hampton Rd via the internal road network and Westaway Rd.

Hampton Rd provides access north and south of the site and the greater public road network provides access all directions for all vehicles in all weather conditions.



### Acceptable Solution A3.2 Public roads

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

Table 4A: Vehicular access technical requirements

Technical Requirement	Public road	Cul-de-sac	Private driveway	Emergency access way	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	N/A	4.5	4.5	4.5
Maximum grade over <50m	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

### Development Response/Recommendations

The public roads provided as part of the subdivision will comply with the public road requirements of Table 4A.

#### Implementation

- Public roads are to be constructed prior to the clearance of subdivision for affected lots serviced by the public road.
- It is the responsibility of the developer to ensure the public road standard is established in accordance with Table 4A.
- It is the responsibility of Local and State Government (as appropriate) to ensure the maintenance of public roads vested within their jurisdiction.





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**BUSHFIRE MANAGEMENT PLAN MAP**  
**Lot 42 and 9001 Hampton Road, Pinjarra**

**Access Map**

-  Site Boundary
-  Main Road
-  Direction



Size: A4  
 Scale: 1:6,000

0 50 100 150 200 250 m

Ref: 5049\_004\_01\_Access\_20160503  
 Projection: GDA94 MGA50  
 Author: MWA - RUIC | Date: 2016-05-03  
 Data Source: Cadastre - Landgate; Imagery -  
 Nearmap; Roads, Site Boundary - RUIC.

Disclaimer: Although the data within this map is considered accurate at the time of creation, RUIC Fire does not guarantee, and accepts no legal liability whatsoever arising from or connected to, the accuracy, reliability, currency or completeness of any data used within this map.

Figure 4B: Site Access



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

N/A – No cul-de-sacs are proposed as part of this development.

**Acceptable Solution A3.4 Battle-axe**

No Battle-axes included in the development, therefore A3.4 is not applicable.

**Acceptable Solution 3.5 Private Driveway longer than 50 metres**

No private driveways longer than 50m are included in the development, therefore A3.5 is not applicable.

**Acceptable Solution 3.6 Emergency Access Way**

N/A – No emergency access ways are proposed as part of this development.

**Acceptable Solution 3.7 Fire Service Access Routes (Perimeter Roads)**

No Fire Service Access Routes are included in the development, therefore A3.7 is not applicable.

**Acceptable Solution 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.

**Development Response/Recommendations**

Any balance title lots are required to have a fire break installed in accordance with the requirements of A3.8 unless otherwise required to be an APZ or low threat vegetation area.

## 4.4 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 (P4):** The subdivision, development or land use is provided with a permanent and secure water supply that is sufficient for firefighting purposes.

<b>Solution</b>	<b>AS</b>	<b>PBS</b>	<b>N/A</b>	<b>Comment</b>
A4.1 Reticulated Areas	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
A3.2 Non-reticulated Areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
A3.3 Individual lots within non-reticulated areas	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



**Acceptable Solution 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.

**Development Response/Recommendations**

The site will be serviced by reticulated scheme water and firefighting hydrants, satisfying Acceptable Solution A4.1. The locations of the firefighting hydrants will be determined as part of the engineering design for the subdivision in accordance with the water supply authority's requirements.

**Acceptable Solution A4.2      Non-reticulated areas**

The subdivision will be serviced by a reticulated water supply. Therefore, A4.2 is not applicable to this subdivision.

**Acceptable Solution A4.3      Individual lots within non-reticulated areas**

The subdivision will be serviced by a reticulated water supply. Therefore, A4.3 is not applicable to this subdivision.



## 5.0 Implementation and Enforcement

Table 5A summarises the responsible party for each mitigation strategy and the time frame in which it must be completed.

Table 5A: Developer Schedule of Works

Strategy	Implementation		Maintenance	
	Responsible	Time Frame	Responsible	Time Frame
Amendments to BMP	Any amendments to this BMP shall be approved by the relevant Jurisdiction Having Authority.			
Asset Protection Zone	Developer	Prior to subdivision clearance	Individual Land Owners	Ongoing
Hazard Separation Zone	N/A	N/A	N/A	N/A
20m Hazard Separation area implementation and maintenance	Developer	Prior to subdivision clearance	Developer	Until subdivision of Lot 9001 permanently removes all vegetation
Construction to AS 3959	Individual Land Owners & Local Government	On construction of all habitable buildings	Individual Land Owners	Ongoing
Cul-de-sacs	N/A	N/A	N/A	N/A
Battle Axes	N/A	N/A	N/A	N/A
Private Driveways & Turnaround Area	N/A	N/A	N/A	N/A
Emergency Access Ways	N/A	N/A	N/A	N/A
Fire Service Access Routes	N/A	N/A	N/A	N/A
Firebreaks	Developer	Prior to subdivision clearance	Individual Land Owners	Ongoing
Firefighting Water (hydrants)	Developer	Prior to subdivision clearance.	Water Corporation	Ongoing
Firefighting Water (private tanks)	N/A	N/A	N/A	N/A
Firefighting Services & Response	DFES and Local Government	Ongoing	DFES and Local Government	Ongoing
Fuel Load Reduction and Fire Break Notice	Local Government	In accordance with firebreak notice	Local Government	In accordance with firebreak notice
Inspection and Issue of Works Orders or Fines.	Local Government	Ongoing	Local Government	Ongoing



## 6.0 References

- Standards Australia. (2009). AS 3959:2009 Construction of buildings in bushfire prone areas: SAI Global.
- Standards Australia. (2009). ISO AS 31000:2009 Risk management principles and guidelines: SAI Global.
- Standards Australia. (2013). HB89:2013 Risk management - Guidelines on risk assessment techniques (Vol. HB 89:2013). Sydney: SAI Global.
- Standards Australia. (2013). HB 436:2013 Risk management guidelines - Companion to AS/NZS ISO 31000:2009 (Vol. HB436:2013). Sydney: SAI Global.
- WAPC. (2006). State Planning Policy 3.4 Natural Hazards and Disasters. State Law Publisher.
- WAPC. (2015a). State Planning Policy 3.7 Planning in Bushfire Prone Areas. Western Australian Planning Commission & Department of Planning.
- WAPC. (2015b). Guidelines for Planning in Bushfire Prone Areas. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.
- WAPC. (2015c). Guidelines for Planning in Bushfire Prone Areas Appendices. Western Australian Planning Commission, Department of Planning & Department of Fire and Emergency Services.
- WAPC. (2015d). Planning Bulletin 111/2015 Planning in Bushfire Prone Areas. Western Australian Planning Commission.



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## 7.0 Appendix A - Plot 6 Fuel Load Management Confirmation



**From:** [Darrel \(RUIC Fire\)](mailto:Darrel@ruic.net.au)  
**To:** [darrel@ruic.net.au](mailto:darrel@ruic.net.au)  
**Subject:** FW: Lots 42 & 9001 Hampton Road, Pinjarra  
**Date:** Thursday, 15 September 2016 5:47:30 PM  
**Attachments:** [image013.png](#)  
[image003.png](#)  
[image012.png](#)

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**From:** Cherryll Oldham [<mailto:CherryllO@murray.wa.gov.au>]  
**Sent:** Thursday, September 15, 2016 1:29 PM  
**To:** [louisa@ruic.net.au](mailto:louisa@ruic.net.au)  
**Subject:** RE: Lots 42 & 9001 Hampton Road, Pinjarra

Hi Louisa

Grant Bilton, the Shire's Coordinator Parks Development & Waterways has advised the reserve is a dry park with no irrigation and is used for drainage.

The reserve is mown periodically and is maintained in a low fuel condition.

Kind regards,

Cherryll Oldham  
Senior Planning Officer

 	<p>PO Box 21 - Pinjarra - WA - 6208 - Australia</p> <p>Tel: +61 8 9531 7739</p> <p>E-mail: <a href="mailto:CherryllO@murray.wa.gov.au">CherryllO@murray.wa.gov.au</a></p> <p>Fax: +61 8 9531 1981</p> <p>social </p>
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 Please consider the environment before printing this e-mail.

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**From:** [louisa@ruic.net.au](mailto:louisa@ruic.net.au) [<mailto:louisa@ruic.net.au>]  
**Sent:** Thursday, 15 September 2016 11:24 AM  
**To:** Cherryll Oldham <[CherryllO@murray.wa.gov.au](mailto:CherryllO@murray.wa.gov.au)>  
**Cc:** Darrel (RUIC Fire) <[darrel@ruic.net.au](mailto:darrel@ruic.net.au)>  
**Subject:** Lots 42 & 9001 Hampton Road, Pinjarra

Hi again Cherryll,

I have another request I am hoping you might be able to help me with.

We have prepared a Bushfire Management Plan over the above property and have received the following advice from WAPC and DFES:

Obtain written confirmation from the Shire of Murray that Reserve R50125 Westaway Road, Pinjarra is managed in a low fuel condition

in accordance with the requirements of Australian Standard 3959-2009: Construction of buildings in bushfire prone areas

We have based the BAL Contour Maps on this reserve being managed as Low Threat vegetation in accordance with AS 3959 Clause 2.2.3.2(f).

WAPC require a letter from the Shire to state that this reserve is in fact being managed in this way. Please find photos of the reserve below.



Please note, the reserve is identified as **Lot 69 Cornish Way** on Intramaps (see image below).



Thanks again for your help.

**Louisa Robertson | Bushfire Consultant**

BPAD Accredited Practitioner Level 1  
MSc Conservation Biology, BSc Ecology & Zoology



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W: [www.ruic.net.au](http://www.ruic.net.au)

Perth | Busselton | Margaret River | Esperance