



Harley Dykstra

PLANNING & SURVEY SOLUTIONS



Structure Plan Modification RR 34

Lot 9000 Lancaster Road, McKail

Prepared by Harley Dykstra Pty Ltd for J & K Belfield, A & B Lucas and J Lucas

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DOCUMENT CONTROL

Control Version	Date	Status	Distribution	Comment
A	30.09.2016	Draft	Internal	For review
B	19.10.2016	Final	Client	Revisions following QA
C	20.6.2018	Final	CoA/DPLH	Revised to provide two fire EAW options
D				
E				

Prepared for: J & K Belfield, A & B Lucas and J Lucas

Prepared by: DC

Reviewed by: HD

Date: 20.6.2018

Job No & Name: 20833 Belfield & Lucas

Version: C

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1 INTRODUCTION

1.1 Introduction & Purpose

This report forms part of the proposal to modify the Structure Plan (SP) relating to Lot 9000 Lancaster Road, McKail (the 'subject site').

This report details a total of four (4) modifications to the Structure Plan, which reflect current planning rationale, best planning practice and opportunities and constraints of the subject site.

A background of the subject site and surrounding area is provided, prior to detailed discussion of each modification. Further, the report addresses future servicing, impacts of these changes on the surrounding area and key planning considerations guiding future development of the property.

Approval by the City of Albany and Department of Planning, Lands and Heritage is respectfully requested.

1.2 Subject Site Overview

The subject site is currently zoned *Rural Residential* and located within *Rural Residential Area No.34 (RR34)* of the City of Albany Local Planning Scheme No. 1 (LPS1). This area allows for the subdivision of Rural Residential lots down to a minimum size of 1 hectare, based upon land capability, service availability and the approved SP.

1.3 Legal Description

303 Lancaster Road (Lot 9000 on Deposited Plan 70052) is 19.9257ha in area. The property is contained on Certificate of Title Vol. 2814 Fol. 895 and the registered proprietors are:

- Joy Frances Lucas in 1/5 share;
- Jamie Belfield & Kelly Maree Belfield as joint tenants in 2/5 share; and
- Bradley James Lucas and Amy Diane Lucas as tenants in common in 2/5 share

A copy of the Certificate of Title is included in **Appendix A**.

1.4 Location

The property is located approximately 7km north-west of the Albany town centre, via Link Road as illustrated in **Figure 1**.

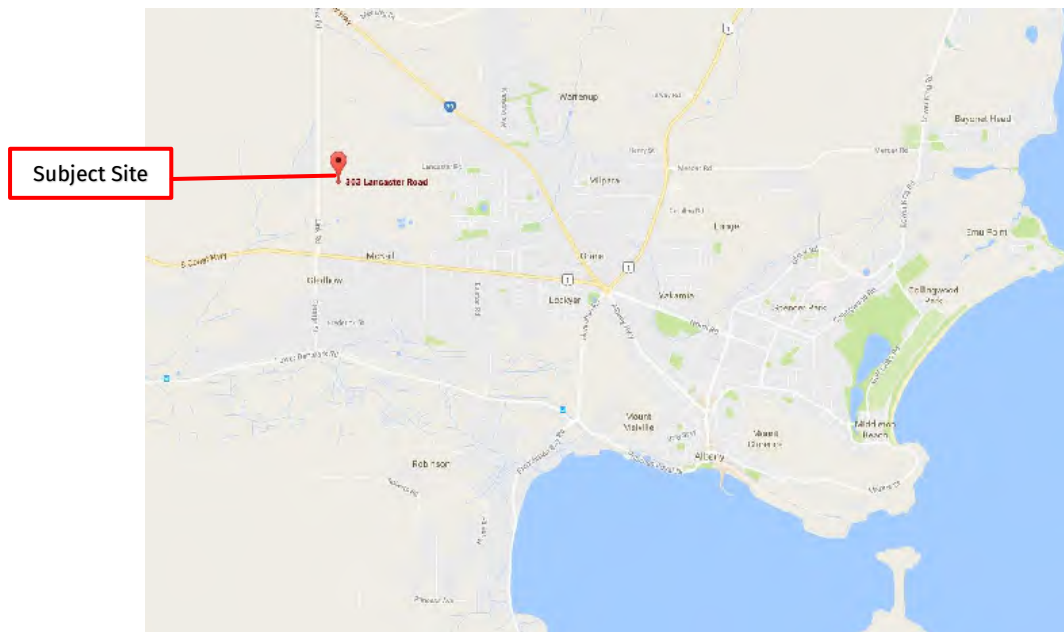


Figure 1: Location plan of Lot 9000 Lancaster Road, McKail

1.5 Surrounding Land Use

The subject site is zoned Rural Residential, however a mapping error is acknowledged on the City of Albany Scheme Map. Refer to **Figure 2** – land use zoning.

The land immediately surrounding the property is zoned for various purposes including General Agriculture, Rural Residential and Future Urban in the City of Albany Local Planning Scheme No.1 (LPS1).

The landholding to the north of the subject site, on the opposite side of Lancaster Road, is zoned *General Agriculture* and is 64.76 hectares in area. The property adjoining the eastern boundary of the subject site is zoned *Future Urban* with developed lot sizes around 4,000m².

Land adjoining the southern boundary of the subject site is zoned *General Agriculture*, with *Rural Residential Area 40 (RR40)* located approximately 300m south of Lot 9000. Lot sizes in RR40 range from one to five hectares.

To the west of the subject site, on the opposite side of Link Road, land is zoned *Rural Residential* and included within *Rural Residential Area 35 (RR35)*. Developed lot sizes in RR35 range from approximately one to seven hectares.

Land adjoining the eastern boundary of the subject site is zoned *General Agriculture*, with *Rural Residential Area 25 (RR25)* located approximately 500m east along Lancaster Road. Lot sizes in RR25 range from one to five hectares.



Figure 2: Land Use Zoning

(Source: DPLH)

1.6 Topography

The site is gently sloping from a maximum height of 65m AHD at the north-west corner of the site fronting Lancaster Road, towards the south-eastern corner of the site which is approximately 38m AHD and south western corner which is 43m AHD.

There are no significant topographical features located on the site including watercourses, wetlands, significant vegetation, flood plains or dams.

1.7 Transport Noise – Link Road

The subject site is impacted by MRWA noise associated with the future development of Link Road as a heavy vehicle transport route. This is denoted on both the Certificate of Title, Deposited Plan and adopted Structure Plan (2008).

Documentation relating to the MRWA noise affected land notes:

“The above land described is situated adjacent to the proposed Albany Ring Road and may be affected by transport noise. Further information regarding transport noise, including development restrictions and noise insulation requirements for noise affected property are available from the City of Albany.”

City of Albany Planning Officers were consulted prior to finalising the amended SP and requested to provide additional information relating to transport noise. Unfortunately additional information was not able to be provided.

1.8 Albany Speedway Noise Special Control Area

The northern portion of the site is affected by a special control area associated with the Albany Speedway. Section 6.5 of the City of Albany Local Planning Scheme outlines provisions relating to the Albany Speedway Noise Special Control Area, including the following:

- *The Local Government may grant planning approval and impose conditions on the approval to require the applicant to incorporate design and construction methods/materials to reduce noise impacts to the dwelling; and*
- *The Local Government shall request the Commission impose a condition on the approval for the creation of any new lots created as a result of subdivision within the Albany Speedway Noise Special Control Area be required to have a memorial placed on the Certificate of Title stating that the land may be subject to temporary high noise levels from activities conducted at the Attwell Park Speedway.*

Future dwellings located within the Albany Speedway Noise Special Control Area will be subject to conditions requiring design and construction to address these noise impacts to the satisfaction of the City of Albany.

1.9 Vegetation

The property is predominantly cleared of vegetation with a small cluster of trees located midway along the eastern portion of the site. A small patch of remnant vegetation is located in the centre of the site dominated by Sheoak trees with scattered Jarrah trees and a grass understory. Small areas of forest line the northern and southern boundaries of the site comprising of both remnant vegetation and exotic plantings closer to neighbouring dwellings in the south.

The amended SP seeks to retain all existing vegetation where possible. The SP modifications include strategic revegetation areas to improve privacy and amenity, without introducing increased bushfire risk. Details of this are outlined in **section 3.3** of this report.

1.10 Existing Buildings & Structures

The subject site accommodates two existing dwellings and associated outbuildings which are located along the northern boundary fronting Lancaster Road. A horse shelter is located approximately 85m from the eastern boundary and 150m from the northern boundary.

Removal of the existing dwellings and outbuildings is not required to implement the Structure Plan modifications.

The amended Structure Plan provides for the eastern dwelling to be setback 13m and the western dwelling 130m from the future road reserve connecting to Lancaster Road.

2 PLANNING BACKGROUND

2.1 City of Albany Planning Strategy (ALPS)

The key local planning document relating to future planning of the subject site is the Albany Local Planning Strategy (ALPS). This proposal is consistent with the intent of ALPS which was endorsed by the WAPC in 2010.

The subject site and surrounding area is designated as Rural Residential on Map 9B of ALPS, as illustrated in **Figure 3**.



Figure 3: ALPS Map 9B extract (Source: CoA ALPS 2010)

Objectives of Rural Residential areas in ALPS include:

- To avoid areas of Rural Living on productive agricultural land, other important natural resource areas and areas of high bushfire risk, flooding and environmental sensitivity;
- Avoid the development of Rural Living areas on future and long term potential urban areas; and
- Minimise the potential for generating land-use conflicts.

The proposed modifications to the Structure Plan support these objectives, as implementation of the amended SP will provide Rural Residential lots within an existing Rural Residential zone and assist to contain encroachment of rural living areas onto agricultural areas and future urban land.

Furthermore, these modifications do not have the potential to generate land use conflicts as the subject lot is already an existing designated Rural Residential area and will be contained within the property boundaries.

2.2 City of Albany Local Planning Scheme No.1 (LPS1)

The City of Albany Local Planning Scheme No.1 (LPS1) is a statutory document responsible for implementing the findings of ALPS, and was endorsed by the WAPC in 2014. LPS1 provides provisions for the control, regulation guidance and coordination of public and private development and the use of land within the scheme area.

The subject site is zoned Rural Residential and designated as area 34 (RR34) of LPS1. Schedule 15 of LPS1 outlines special provisions relating to RR34, including:

1. *Subdivision of RR34 shall generally be in accordance with the Subdivision Guide Plan RR34 endorsed by the CEO, with any minor variations approved by the Western Australian Planning Commission.*
2. *The minimum lot size shall be one hectare.*
3. *The following land uses are 'P' permitted uses –*
 - a) *Single House*
4. *The following land uses are 'D' discretionary uses –*
 - a) *Ancillary Accommodation;*
 - b) *Home Business;*
 - c) *Home Occupation;*
 - d) *Industry – cottage;*
 - e) *Public Utility; and*
 - f) *Rural Pursuit (which shall be limited to existing cleared and pastured land only).*
5. *Any dwelling shall be located outside of any development exclusion areas shown on the Subdivision Guide Plan and all buildings shall achieve the following minimum setbacks –*
 - a) *15 metres from the front boundary;*
 - b) *12 metres from a secondary road boundary; and*
 - c) *10 metres from all other lot boundaries.*

All proposed modifications comply with the existing control provisions listed in Schedule 15 of LPS1.

2.3 Adopted Structure Plan RR 34 (2008)

Rural Residential 34 was the subject of Amendment No. 243 to the City of Albany Town Planning Scheme No.3. Amendment No. 243 allows for the subdivision of Rural Residential lots down to a size of one hectare. A copy of the adopted SP is included in **Appendix B**.

The adopted SP (2008) provides for the subdivision of eighteen lots ranging in size from 1 hectare to 1.05 hectares. It also incorporates three key planning constraints for the site:

1. Access onto Lancaster Road;
2. Future closure of Patricia Place, and road connectivity through to adjoining landholdings to the south; and
3. Future road connectivity to the landholding to the east (Lot 13)

A total of four modifications to the adopted SP (2008) are proposed. **Section 3** of this report outlines each of the proposed modifications and details the planning rationale underpinning these changes.

3 PROPOSED MODIFICATIONS & RATIONALE

Modifications to the adopted SP (2008) are proposed to improve the resultant subdivision within Rural Residential Area No. 34. A total of four (4) modifications are proposed to the adopted Structure Plan. Details of these changes and supporting rationale are described in detail below.

A copy of these modifications are illustrated on the amended SP and included within **Appendix C**.

3.1 Modification 1

Adjusting the lot sizes and layout

This change is proposed to provide a variety of lot sizes and improved shape to address market feedback and current bushfire practices. These changes also allow for an efficient use of the land, by reducing the total length of roadways required to service the lots by approximately 16 per cent, or 150m.

The amended SP ensures all lots are greater than the one hectare minimum prescribed for RR34, and provides for efficient use of the land and services. Further, modification one supports current planning rationale to limit residential development encroaching into productive agricultural land and will not result in conflicting land uses with surrounding properties.

The amended SP will also not negatively impact on the surrounding amenity, or result in an increase to traffic using Lancaster Road.

3.2 Modification 2

Realigning the future road reserve to provide vehicle access and street frontage to all lots.

Modification two is proposed in response to modification one outlined above. To enable access and legal road frontage to all lots, the inclusion of an 18m wide road reserve connecting to Lancaster Road is required. The alignment of this future road reserve is simply modified.

The east west road connection located to the south of the subject site not only provides future connectivity to adjoining lots, but also serves as a strategic fire break. This road will be provided with a temporary cul de sac head to allow vehicles to turn around, until adjoining land is developed in the future.

Prior to preparing the amended SP, consultation was undertaken with Main Roads Western Australia (MRWA) to determine; an appropriate location for access onto Lancaster Road, the provision of future access to Lots to the south which will be affected by the potential closure of Patricia Close, as well as ensuring connectivity to the adjoining landholding to the east is provided.

MRWA advised that access onto Lancaster Road should be no closer than 330m from the centre line of Link Road. A copy of MRWA's advice is attached at **Appendix D**. The amended SP provides a

connection point onto Lancaster Road approximately 363m from the centre line of Link Road, which is able to comply with the requirements of MRWA. Further, realignment of the road reserve provides a future connection to Lots to the south (currently accessed via Patricia Close), and east of the subject lot in accordance with the adopted SP (2008). No direct access is proposed from the subject site to Link Road in accordance with the advice from MRWA.

When the subdivision is implemented, the realigned future road reserve will provide a safe single point of access for future residents to access Lancaster Road from the subject site. A secondary Emergency Access Way is able to be provided, as detailed in **section 3.4** of this report.

3.3 Modification 3

Adjusting the revegetation areas

This modification is required to reflect the revised lot layout. The revised revegetation areas noted on the amended SP will provide visual screening and wind breaks. The revegetation will be subject to APZ standards outlined in SPP 3.7 – Planning in Bushfire Prone Areas, to ensure no increase to bushfire risk to future dwellings.

Native tree species will be planted in the revegetated areas which are endemic to the locality. Planting should occur in winter to achieve the highest success rate.

3.4 Modification 4

Inclusion of an emergency access way

This modification is necessary to ensure two points of access and egress in the event of a bushfire, and to comply with the requirements of SPP 3.7 – Planning in Bushfire Prone Areas.

Prior to finalising the Bushfire Management Plan, extensive consultation occurred between the City of Albany, Main Roads WA (MRWA) and DFES regarding the potential closure of Patricia Close and the opportunity for this to be retained as a controlled Emergency Access Way (gated and not locked) for residents in the event of a bushfire. Whilst the City of Albany supports this proposal, and have indicated they would be prepared to manage this EAW to ensure it is not used for other purposes, an agreement has not yet been finalised between MRWA and DFES for this to occur.

Without a secondary point of access and egress, as is the case with the current adopted Structure Plan (2008), the road layout results in effectively a cul de sac, and places unnecessary risk on the lives of residents in the event of a bushfire emergency. To overcome this risk, two options are proposed to ensure the Structure Plan complies with SPP 3.7, and enable MRWA and DFES to identify the most appropriate outcome for a secondary point of emergency access.

Option One identifies the retention of Patricia Close as an EAW. In the opinion of the bushfire practitioner, this is the preferred option as Patricia Close is an existing public road and this option would provide access and egress from the subject site onto both Lancaster Road and Link Road. The EAW would be gated, not locked and fitted with appropriate signage identifying it as an EAW. Additional signage could be fitted identifying penalties if it was used other than in the event of an emergency. Responsibility for the management of this would be vested with the City of Albany.

Option two provides for an EAW to be located along the eastern boundary of the site and linking onto Lancaster Road, to ensure that residents have two access ways available at all times. This EAW would be ceded as an easement in gross for unobstructed access by residents and fire services in the event of a bushfire emergency. The EAW would also be gated, not locked and fitted with appropriate signage identifying it as an EAW.

Other options for a secondary access were investigated to the east and south, but were deemed not viable. The ability of linking to Timewell Road (1km to the east) is not viable as it crosses a creek and through a Water Corporation Reserve (Wastewater Treatment plant located on Timewell Road). To the south to Beaudon Road there are multiple landowners and again a creek (sensitive land area) to cross which inhibits a potential EAW in that direction. Consultation with adjacent landowners on the matter was pursued, but a resolution was not able to be reached.

The amended Structure Plan illustrates two options available to ensure two points of access are provided, and that it is able to comply with SPP 3.7. Following agreement between MRWA, DFES and the City of Albany, the preferred option can be implemented and the alternative option removed from the adopted amended Structure Plan.

4 SERVICING CONTEXT

The existing dwelling on the subject site is serviced by power, reticulated scheme water, onsite effluent disposal and telecommunication infrastructure. These services are proposed to each lot in the amended SP.

Individual services are outlined in more detail below.

4.1 Water

A reticulated water main is located within the road reserve of Lancaster Road which services the locality. The existing dwellings are connected to this reticulated scheme water.

Section 5.5.13.2.10 of LPS 1 notes *“where available, a reticulated water supply from a licensed water service provider shall be provided to each lot.”* All proposed lots are able to be serviced with reticulated scheme water extending from the Water Corporation mains located within the Lancaster Road reserve.

4.2 Electricity

Both aerial power and underground power are present in the Lancaster Road and Patricia Close road reserves with the existing dwellings being serviced by an overhead electrical supply(s).

All proposed lots will be serviced with an underground electricity supply in accordance with Western Power requirements.

4.3 Gas

No reticulated gas is available in the area. Any use of gas will be required to be supplied using bottled gas.

4.4 Telecommunications

Telecommunications lines are available in Lancaster Road reserve and the existing houses will maintain their connections to this service. All proposed lots may be serviced with a telecommunication connection.

4.5 Access

Access to the amended SP is to occur via a single access road, joining to Lancaster Road, which will connect to an east-west connection at the southern portion of the subject site. Details of this road are discussed in more detail in **section 3.2** of this report.

The amended SP also proposes two 6m wide battleaxe driveways, collocated to provide a 12m wide access and assist with reducing bushfire risks. The battleaxe driveways will provide all weather access and be constructed to a compacted gravel or limestone standard at the time of subdivision.

Further details on emergency access is discussed in **section 3.4** of this report.

4.6 Bushfire Management and Emergency Egress

The property is located within a bushfire prone area, as prescribed by the Commissioner of Fire and Emergency Services. State Planning Policy 3.7 - Planning in Bushfire Prone Areas, requires subdivision applications for properties identified within bushfire prone areas to be supported by a Bushfire Management Plan prepared by a certified bushfire planning practitioner.

A Bushfire Management Plan has been prepared by Bio Diverse Solutions outlining various measures that enable the amended Structure Plan to comply with SPP 3.7, including; location, siting and design of development, access and water. A copy of the Bushfire Management Plan is included at **Appendix F**.

The Bushfire Management Plan confirms that the amended Structure Plan is able to comply with the requirements of SPP 3.7. Further details regarding vehicle access can be found in **section 3.4** of this report.

4.7 Effluent Disposal

As reticulated sewerage is not available within the locality, the existing dwellings are connected to traditional septic systems with leach drains.

A detailed land capability assessment was previously prepared over the land confirming suitable clearances from the ground surface to late winter ground water levels to accommodate onsite effluent disposal to all lots. This land capability assessment supported the adopted SP (2008) which was adopted by the City of Albany.

A copy of the land capability assessment is included at **Appendix E**, which notes:

“Even though much of the site is gently sloping, waterlogging is a potential limitation along the southern boundary. It is recommended that dwellings be located on the higher ground on the southern lots.”

This recommendation has been acknowledged in the SP modifications.

4.8 Drainage

Due to the nature of the property, drainage currently occurs through ground infiltration. All future residential development will require drainage to be contained on-site to the satisfaction of the City of Albany. This is likely to occur through a combination of soak-wells, drainage swales and rainwater tanks.

Surface run off associated with the paved road will be contained within roadside swales which will drain via ground infiltration. This method of drainage has been adopted throughout other Rural Residential estates and has proven to function well.

5 CONCLUSION

This report forms part of the proposal to amend the adopted Structure Plan (2008) relating to Rural Residential Area 34 (the ‘*subject site*’), and details four (4) modifications that acknowledge market feedback, current planning rationale, best planning practice and opportunities and constraints of the subject site.

The modifications proposed within the amended SP represent a logical consolidation based upon sound planning rationale, and supports an attractive and efficient manner in which to subdivide the land.

The proposed modifications to the SP are justified on the following grounds:

1. The modifications duly consider and comply with ALPS, LPS 1 and development control provisions relating to Rural Residential Area No.34, including:
 - a. Potential future closure of Patricia Close;
 - b. Providing future connectivity to lots to the south and east;
 - c. Access to Lancaster Road is suitably setback from Link Road;
2. All proposed lots will meet or exceed the minimum lot size of one hectare prescribed for Rural Residential Area No. 34.
3. All lots are able to accommodate dwellings of suitable shape and size outside development exclusion areas.
4. All lots are able to be connected to the Water Corporation’s reticulated water supply, as prescribed in ALPS and LPS1.
5. The proposed modifications will not negatively impact on the surrounding areas or amenity;
6. The proposed modifications will allow the landowners to subdivide the land and ensure future access is provided for lots to the south and east.

7. The amended Structure Plan is able to comply with all relevant local and State policies and provides increased protection to life and assets in accordance with current policy requirements.

Approval of the amended Structure Plan by the City of Albany and Department of Planning, Lands and Heritage is respectfully requested.

APPENDIX A

Certificate of Title

WESTERN



AUSTRALIA

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

REGISTER NUMBER 9000/DP70052	
DUPLICATE EDITION 1	DATE DUPLICATE ISSUED 24/7/2013

VOLUME
2814FOLIO
895

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 9000 ON DEPOSITED PLAN 70052

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

JOY FRANCES LUCAS OF 20 PATRICIA CLOSE, MCKAIL
IN 1/5 SHARE
JAMIE BELFIELD
KELLY MAREE BELFIELD
BOTH OF 21 KENDALL COURT, WARRENUP
AS JOINT TENANTS IN 2/5 SHARE
BRADLEY JAMES LUCAS
AMY DIANE LUCAS
BOTH OF 37 PEGASUS BOULEVARD, MCKAIL
AS JOINT TENANTS IN 2/5 SHARE
AS TENANTS IN COMMON

(T M756022) REGISTERED 2 SEPTEMBER 2014

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

1. *M348078 NOTIFICATION CONTAINS FACTORS AFFECTING THE WITHIN LAND. AS TO PORTION ONLY SEE SKETCH ON DEPOSITED PLAN 70052 ONLY LODGED 22.7.2013.
2. *M756023 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA REGISTERED 2.9.2014.

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.

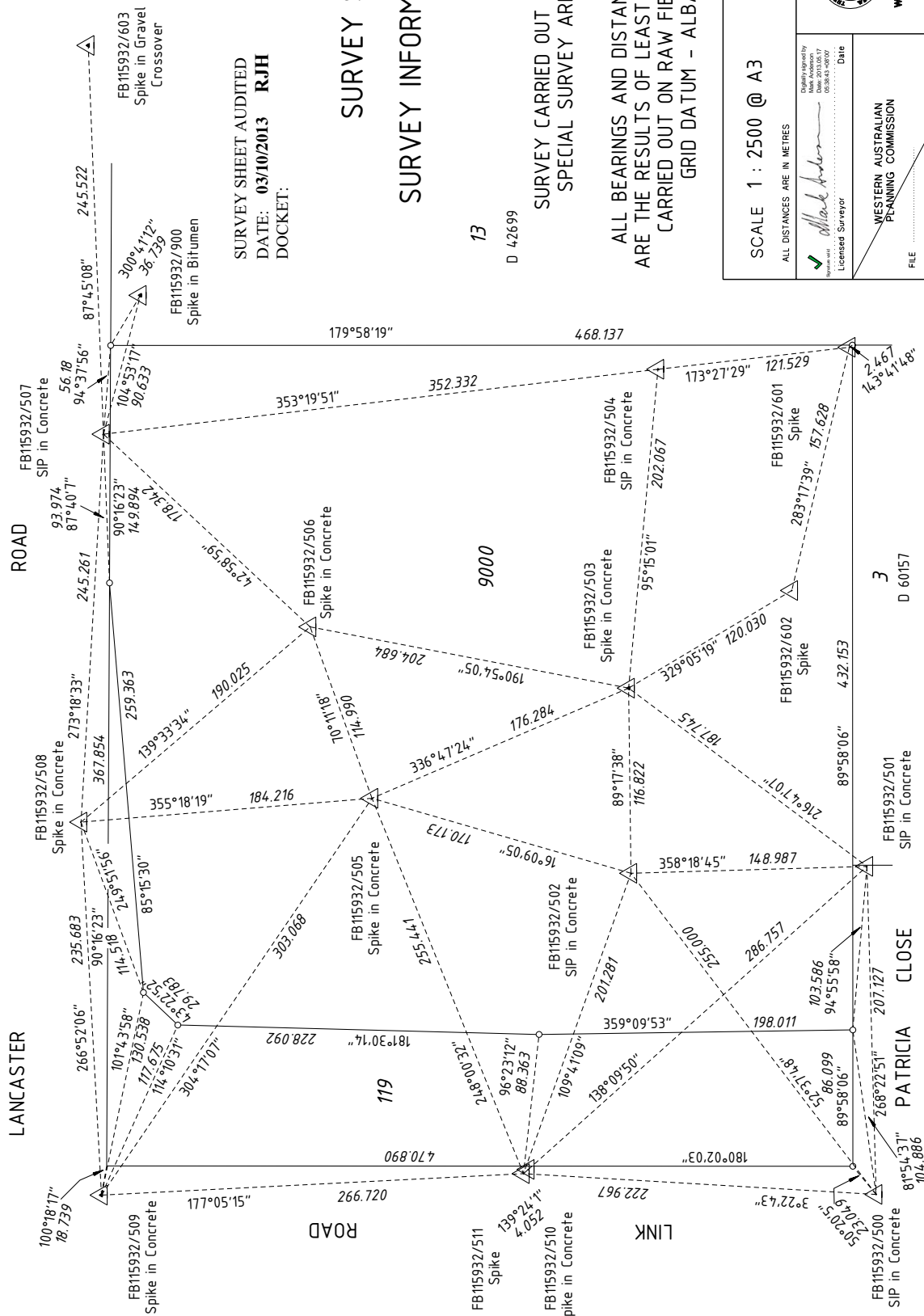
SKETCH OF LAND: DP70052.
PREVIOUS TITLE: 1426-575, 1426-574.
PROPERTY STREET ADDRESS: 303 LANCASTER RD, MCKAIL.

END OF PAGE 1 - CONTINUED OVER

[illegible]

HELD BY LANDGATE
IN DIGITAL FORM ONLY.

FOR HEADING SEE SHEET 1



SURVEY SHEET AUDITED
DATE: 03/10/2013 RJH
DOCKET:

SURVEY SHEET SURVEY INFORMATION ONLY

13

D 42699

SURVEY CARRIED OUT UNDER REG 26A
SPECIAL SURVEY AREA GUIDELINES

ALL BEARINGS AND DISTANCES ON THIS SHEET
ARE THE RESULTS OF LEAST SQUARE ADJUSTMENTS
CARRIED OUT ON RAW FIELD OBSERVATIONS
GRID DATUM - ALBANY GRID '94

SCALE 1 : 2500 @ A3

ALL DISTANCES ARE IN METRES

Quality registered by
Mark Anderson
08 9463 1087
Date



Landgate
Western Australian Land Information Authority

WESTERN AUSTRALIAN
PLANNING COMMISSION

FILE

DATE

DELEGATED UNDER S 16 & 17 Act 2005

DEPOSITED PLAN

70052

SHEET 2 OF 2 SHEETS
VERSION 2

50 0 SCALE 1 : 2500 @ A3 200

ALL DISTANCES ARE IN METRES

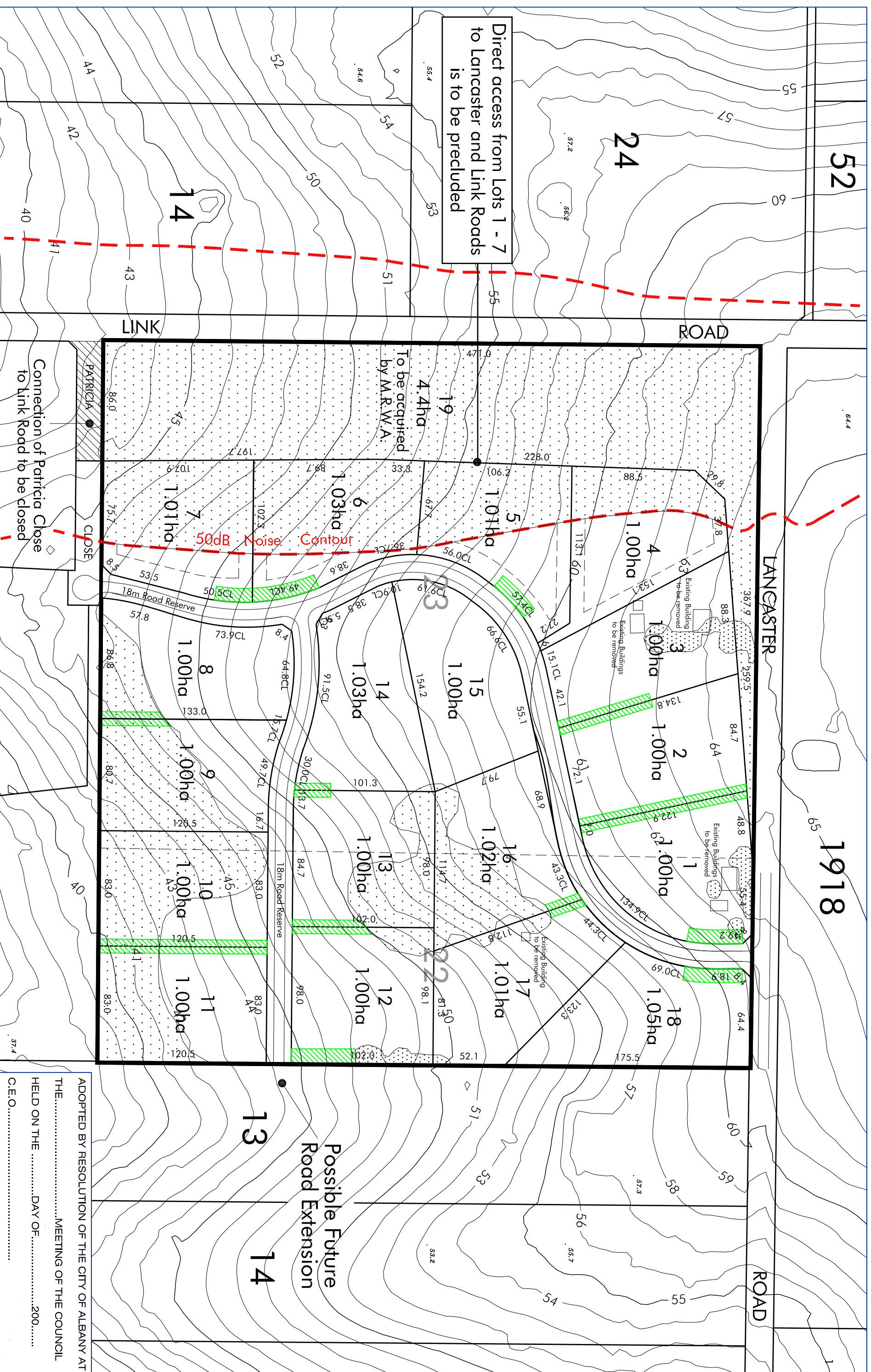
FOR INTERESTS AND NOTIFICATIONS SEE SHEET 1

APPENDIX B

Adopted Structure Plan (2008)

SUBDIVISION GUIDE PLAN
LOTS 22 & 23 LANCASTER ROAD
ALBANY

THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE COMMISSION. UNAUTHORISED USE OF THIS DOCUMENT IN ANY FORM WHATSOEVER IS PROHIBITED.



ADOPTED BY RESOLUTION OF THE CITY OF ALBANY AT
THE.....MEETING OF THE COUNCIL
HELD ON THEDAY OF200.....
C.E.O.....

Possible Future Road Extension

GRAY & LEWIS
LAND USE PLANNERS



Suite 5, 2 Hardy Street
South Perth, WA 6151
T (08) 9474 1722
F (08) 9474 1172
perth@graylewis.com.au

APPENDIX C

Amended Structure Plan

APPENDIX D

MRWA Advice

David Congdon

From: GRANT Chris (AMO/A) <chris.grant@mainroads.wa.gov.au>
Sent: Tuesday, 28 June 2016 2:24 PM
To: David Congdon
Subject: RE: Lot 9000 Lancaster Rd, McKail
Attachments: 20833 Building setback.jpg; 20833 MRWA setback.jpg

Hi David

As the proposed location will not affect the current planned extent of earth works for the Lancaster Rd – Albany Ring Road intersection we have no in principle objection to the access being located as shown in the attached diagrams subject to the following:

- 1) No earthworks associated with the proposed access are to be within 330m of Lancaster Road.
- 2) Patricia Cl must be connected to Lancaster Road by a public and gazetted road reserve.

Regards

Chris Grant

Asset Management Officer
Great Southern Region
Metropolitan and Southern Regions
p: 08 9892 0524 | m: 0427 388 047
w: www.mainroads.wa.gov.au



mainroads
WESTERN AUSTRALIA



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From: David Congdon [mailto:DavidC@HarleyDykstra.com.au]
Sent: Monday, 27 June 2016 1:00 PM

To: GRANT Chris (AMO/A)
Subject: RE: Lot 9000 Lancaster Rd, McKail

Hi Chris,

Thanks for your follow up on this.

Based on these requirements, it appears that the Lancaster Rd connection could be relocated to the west of the existing dwelling. The existing dwelling is located approximately 370 metres from the Lancaster/Link Rd intersection, as illustrated in the attached picture. This would leave a zone of around 30 metres to locate the 18m wide road reserve and achieve a suitable setback to the building..

Would MRWA be supportive of relocating the access within the relocation zone attached? If so, we will progress discussions with the City of Albany.

Appreciate your assistance with this.

Kind Regards,

David Congdon B.Com (Property & Finance), Grad Dip (Urban & Regional Planning)
Senior Town Planner / Land Development Consultant

T: 08 9844 5100 | M: 0438 414 408 | F: 08 9841 3643
Web: www.harleydykstra.com.au



Albany Bunbury Busselton Kelmscott Perth

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From: GRANT Chris (AMO/A) [<mailto:chris.grant@mainroads.wa.gov.au>]
Sent: Friday, 24 June 2016 1:54 PM
To: David Congdon <DavidC@HarleyDykstra.com.au>
Subject: RE: Lot 9000 Lancaster Rd, McKail

Hi David

Main Roads comments on the access from Lancaster Road are as follows.

- 1) Current planned earthworks for the Albany Ring Road / Lancaster Road interface extend approximately 330m metres along Lancaster Rd from the current CL of Link Rd. Therefore any earthworks associated with a proposed access from Lancaster Road must be further east of this point.

Main Roads requirements in relation to providing connectivity from Patricia Cl to Lancaster Road are as follows:

- 1) Patricia Cl must be connected to Lancaster Road by a public and gazetted road reserve.

All of the above is also subject to clearance by the City of Albany.

Regards

Chris Grant

Asset Management Officer
Great Southern Region
Metropolitan and Southern Regions
p: 08 9892 0524 | m: 0427 388 047
w: www.mainroads.wa.gov.au



mainroads
WESTERN AUSTRALIA



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From: David Congdon [<mailto:DavidC@HarleyDykstra.com.au>]

Sent: Friday, 24 June 2016 10:40 AM

To: GRANT Chris (AMO/A)

Subject: Lot 9000 Lancaster Rd, McKail

Hi Chris,

Thanks for taking the time to meet yesterday to discuss the proposed access point for the above property onto Lancaster Rd.

Once you've had an opportunity to review MRWA policy, and complete a site inspection, could you please advise MRWA's position on the proposed access point.

Thanks again.

Kind Regards,

David Congdon B.Com (Property & Finance), Grad Dip (Urban & Regional Planning)
Senior Town Planner / Land Development Consultant





APPENDIX E

Land Capability Assessment

GEOTECHNICAL and LAND CAPABILITY ASSESSMENT LOTS 22 and 23 LANCASTER ROAD, ALBANY

1 April 2005

It is proposed to subdivide Lots 22 and 23, Lancaster Road, Albany into 21 lots of 1 plus hectares.

The site is bounded on the north by Lancaster Road and on the west by Link Road. As there is a possibility that Link Road may be widened at some point in the future the lots along Link Road have been made slightly larger.

Currently Lots 22 and 23 are cleared, apart from two clumps of trees, having been used for sheep grazing in recent times. A church and associated parking area adjoins to the east.

The site was visited on 31 March 2004.

During the inspection a backhoe was used to excavate 11 holes across the site. The holes were inspected by City of Albany Senior Environmental Health Officer, Mr Greg Harwood who inspected most of the test holes as they were sunk.

The site was walked and the vegetation briefly looked at, and the species identified.

1.0 EXISTING SITE CONDITIONS

1.1 Vegetation

The only vegetation is two clumps of trees. There are predominantly *Eucalyptus calophylla* in the east with *E. calophylla* and *E. steerei* in the west. The only shrub species recorded were *Kingia australis* and *Allocasuarina fraseriana*. There were no native ground covers or low shrubs noticed.

The understorey is pasture.

1.2 Geology and Soils

The site lies on the south facing crest of a slope, dropping from 65 metre AHD at Lancaster Road down to 38 metres in the south eastern corner and 43 metres in the south west.

A weak drainage line runs to the south western corner and has evidence of surface storm action that has resulted in a small erosion gully to 400 mm deep in the central south west mainly due to a change of slope. This grades out to pasture further south.

The site occupies the edge of the dissected horizontally bedded Tertiary sediments formed from a marine incursion. These tend to be fine sediments, predominantly silts and fine sands with a clay component belonging to the Plantagenet Group, with

dissection in more recent times and subjected to laterisation in the later Tertiary and into the Recent.

The soils tend to have a leached sandy layer that has formed by redistribution of surface sand through either colluvial or aeolian processes. Underlying this are weakly ferricreted or iron indurated layers overlying yellow silty clays, and clay silts. On the southern slopes the ferricrete is more prominent and harder.

Soil descriptions are attached as the backhoe logs.

These soils are well known for the nutrient and water retaining qualities and phosphate adsorption, because of the yellow goethite, iron oxides clay and silt in the subsoils. Leached white surface sand has low phosphorous retention capability.

The phosphorous retention of yellow sands, for example on the Swan Coastal Plain, has been the subject of many studies which all found that yellow sands have good phosphate retention ability. For example, Lantze N, 1997, *Phosphorous and nitrate loss from horticulture on the Swan Coastal Plain*, Department of Agriculture Miscellaneous Publication 16/97.

1.3 Ground Water

The water table is estimated to be 5 - 10 metres, but may be shallower where water is forced towards the surface due to underlying ferricrete in the south east. This can be avoided during location of developments.

2.0 GEOTECHNICAL FACTORS

2.1 Foundation Stability

Based on the depth of sand the foundation stability of Lots 22 and 23 is rated as AS 2870 Site Class A - S. Individual sites are recommended to be assessed because of lateral and vertical changes in the soil profile and changes in soil moisture across the site.

Site Class P may apply, for example to constructions requiring more than 400 mm natural fill and/or 800 mm sand which will require adequate compaction to prevent differential settling.

GEOTECHNICAL ISSUE	MANAGEMENT
Foundation stability	<ul style="list-style-type: none"> AS 2870 Site Class A - S. Individual sites are recommended to be assessed because of lateral and vertical changes in the soil profile and changes in soil moisture across the site.

2.2 Drainage and Flood Risk

Even though much of the site is gently sloping, waterlogging is a potential limitation along the southern boundary. It is recommended that dwellings be located on the higher ground on the southern lots. See attached the area marked by the red line in the attached plan.

On geomorphological and field evidence, the only risk areas are storm flows down drainage line in the south west where there is a break of slope.

GEOTECHNICAL ISSUE	MANAGEMENT
Flood risk	<ul style="list-style-type: none"> It is recommended that dwellings be located on the higher ground in the south west. See attached plan.

2.3 Stability of Dams

There is low potential for dams, because the water table is interpreted to be too deep at 5 metres.

GEOTECHNICAL ISSUE	MANAGEMENT
Stability of dams	<ul style="list-style-type: none"> No management issues

2.4 Landslip Risk

The site is underlain by stable silty sands. Slopes are gentle to moderate.

GEOTECHNICAL ISSUE	MANAGEMENT
Landslip Risk	<ul style="list-style-type: none"> Australian Geomechanics Society Guidelines Very low, restricted to minor settlement that will be overcome by good construction techniques.

2.5 Potential for Acid Sulfate Soils

The issue with potential acid sulfate conditions is the exposure of soils or sediments containing iron sulfide to the atmosphere, normally by digging up. The two main types of soil conditions that can lead to the conditions for acid sulfate occurrence are soils associated with saline and estuarine conditions, normally below 5 metres AHD above sea level and peaty swamps where exposure can occur through excessive pumping of surface or superficial water. Gley soils as shown in the Munsell Soil Colour Charts are also worthy of investigation.

None of these conditions were recorded on site and are unlikely based on the geology and geomorphology.

GEOTECHNICAL ISSUE	MANAGEMENT
Acid sulfate conditions	<ul style="list-style-type: none"> Planning Bulletin 64 EPA Guidelines for the management of Acid Sulfate Soils No evidence of soils that warranted any investigations for acid sulfate were recorded.

3.0 ENVIRONMENTAL MANAGEMENT

The following items are identified as the most likely to impact on the environment. These items can be managed by the implementation of the management recommendations. Other items are unlikely to impact or the impact is regarded as small.

3.1 Landscape Management Vegetation Plan

With subdivision there is an opportunity to plant additional trees and other vegetation. As there is the possibility that Link Road may be widened at some point in the future, this may require the removal of some trees. Tree planting can improve the buffer between the dwellings and the church to the east and well as provide separation buffers. The vegetation can link existing vegetation into corridors.

Views are to the south and therefore it is more desirable to plant trees in clumps and north south lines rather than east west lines. There needs to be a compromise between the maintenance of views, visual separations and aesthetics. Land holders are unlikely to sustain boundary trees that restrict views.

It is suggested that the trees be planted at 3 metre centres. The ground must be correctly prepared by;

- removal of pasture competition by removing topsoil or spraying
- deep ripping the soil and mounding in the south
- planting during winter spring
- protection from stock if stock are kept
- provision of each tube plant with a 10 g fertiliser tree tablet.
- planting a mixture of taller and smaller plants

A total of 1 000 tube plants will be sufficient to cover the areas suggested. These should be planted in winter.

Local species suitable for planting. See the attached plan for the recommended location of the tree planting. Other local species may be substituted as available.

Family	Genus/Species
Casuarinaceae	<i>Allocasuarina fraseriana</i>
Mimosaceae	<i>Acacia myrtifolia</i>
	<i>Acacia pulchella</i>
Myrtaceae	<i>Agonis flexuosa</i>
	<i>Astartea fascicularis</i>
	<i>Callistemon glaucus</i>
	<i>Corymbia calophylla</i>
	<i>Corymbia ficifolia</i>
	<i>Eucalyptus cornuta</i>
	<i>Eucalyptus diversicolor</i>
	<i>Eucalyptus megacarpa</i>

	<i>Eucalyptus marginata</i>
	<i>Eucalyptus patens</i>
	<i>Eucalyptus rudis</i>
	<i>Eucalyptus steeri</i>
	<i>Melaleuca cuticularis</i>
	<i>Taxandria linearifolia</i>
	<i>Taxandria parviceps</i>
	<i>Taxandria marginata</i>
Papilionaceae	<i>Bossiaea aquifolium</i>
	<i>Callistachys lanceolata</i>
Proteaceae	<i>Banksia grandis</i>

ENVIRONMENTAL ISSUE	MANAGEMENT
Remnant vegetation	<ul style="list-style-type: none"> Development should include preservation of existing remnant vegetation. Mature trees should be preserved and protected from grazing pressure.
Dwellings, fences and other developments are to be aesthetically compatible with the area.	<ul style="list-style-type: none"> Restrictions can be placed on the use of visually non compatible materials.
Vegetation Planting	<ul style="list-style-type: none"> 1000 trees and shrubs of local species planted in areas identified on the attached plan. Planting should be to the guidelines above. Protect the trees by fencing if stock are kept.

3.2 Nutrient Management - Capability for On Site Effluent Disposal

In recent years Lots 22 and 23 have been used for grazing.

With subdivision, it is likely that a significant number of the created one hectare lots will not have stock but some may have stock.

With yellow earthy silts and sand, there is likely to be low risk of phosphorous input to the groundwater system or nearby water bodies to the south provided the waste water from a waste water disposal system is contained or retained within the soil profile.

Phosphorous Retention Index (PRI) tests can frequently be misleading because all materials greater than 2 mm are sieved from the sample prior to testing. This means that a gravelly sand will have the phosphate retaining gravel removed from the sample prior to testing, most likely resulting in a PRI value much lower than the actual situation. On the other hand y clay normally has a high PRI, but the reduced permeability of the clay means that nutrient enriched water may not or only slowly penetrate the clay layer. This results in far lower phosphate retention in the field than indicated by the PRI. In the case of the subject land interpretations of the nutrient management of the soils is considered to be more valid.

The yellow silts and clays, combined with the iron indurated ferricrete have inherently high phosphorous retention capability. The phosphate retention and thus (PRI) of all soils on site are generally high when considering the whole soil profile. The soils were compared to the database of type soils held by Landform Research for PRI and with Chemistry Centre data.

Nitrogen loss through denitrification will follow a similar path. Nitrates are normally taken up by vegetation, denitrified by bacteria under anoxic soil conditions or lost through volatilisation of ammonia. The waste water disposal areas are known to provide for denitrification because they act like sand filters on which there has been research.

For example the influence of moist soils for denitrification was evident in research by Gerritse et al 1995A, on leach drains servicing septic tanks in the Perth Hills in gravel soils, shows that under wet conditions nitrogen is effectively lost within 10 metres. Many other studies, for example Dawes and Goonetilleke, have found that all nitrogen can be lost within 1 metre in damp soil conditions. Lantzke 1997, also found high levels of denitrification in moist leached sands on the Swan Coastal Plain. These moist soil features would apply on this site.

Gerritse et al, 1995B, found that all phosphate was adsorbed within 2 metres from a 7 year old leach drain in Yarrigal loam soils that have some similarity for phosphate retention as the silty yellow sands. The critical point is retention times within the soils.

Lantzke 1997, showed the breakthrough times were low for phosphate in leached sands on the Swan Coastal Plain, although these were not underlain by subsoils of high phosphate retaining characteristics. He also found that in soils where organo-ferricrete subsoil horizons occurred that phosphate export was significantly reduced and minimised by the high PRI of the organo ferricrete. The water retaining quality of the earthy silts and silty clays provide greater time scales for soil microbial bacteria to denitrify waste water.

Nutrients will be taken up by soil microbial material and it is difficult to quantify its effect. However a horse has a typical loading of 11 kgP/year and 60 kg/N/year. To this needs to be added the influence of pets, gardens and conventional septic systems or alternative waste water systems.

Data is taken from Van Gool D, K Angell and L Stephens, 2000, *Stocking Rate Guidelines for Rural Small Holdings Swan Coastal Plain and Darling Scarp*, Department of Agriculture, Miscellaneous Publication 02/2000, Legislative Assembly, 1994, *Select Committee on Metropolitan Development and Groundwater Supplies, Western Australia*, Dames and Moore, undated, *Draft nitrate management in Jandakot UWPCA*, Water Authority of Western Australia. From the above references a typical lot with a conventional septic system, small garden and lawn, dog and cat plus some chickens has a nutrient loading of 31 kg/N/year and 9.6 kg/P/year.

Typical nutrient loadings of some land uses

Possible lot size and activity	Nitrogen loading per hectare	Phosphorous loading per hectare	Likely nutrient scenario
Estimated current nutrient loading equivalent to 10 - 12 sheep per hectare and two houses. (averaged for the site)	103.1 - 123.2 kg/N/ha/year	15.5 - 18.4 kg/P/ha/year	Unlikely to be nutrient loss
Likely average nutrient input after subdivision to one hectare lots and an average of one horse per lot and conventional septic systems.	91.0 kg/N/ha/year	20.6 kg/P/ha/year	Similar nutrient loading, slightly increased for phosphorous. Unlikely to be nutrient loss due to high phosphate retention capability of the soils.
Likely average nutrient input after subdivision to one hectare lots and an average of one horse per two lots conventional septic systems.	61.0 kg/N/ha/year	14.1 kg/P/ha/year	Reduced nutrient loading. Unlikely to be nutrient loss plus reduced nutrient loading

Likely average nutrient input after subdivision to one hectare lots and no horses per lot and conventional septic systems.	31.0 kg/N/ha/year	9.6 kg/P/ha/year	Reduced nutrient loading. Unlikely to be nutrient loss plus reduced nutrient loading
Likely average nutrient input after subdivision to one hectares with an average of one horse per two lots and alternative waste water systems.	52.0 kg/N/ha/year	8.6 kg/P/ha/year	Reduced nutrient loading. Unlikely to be nutrient loss plus reduced nutrient loading

The main issues with nutrients are the management of concentrated nutrient inputs, such as mucking out stables and the treatment/disposal of manure. Manure that is widely spread across pasture or gardens or removed off site is preferable to manure being left in one pile.

The soils on this site and the depth to groundwater are well suited to the keeping of horses. The soil profile has good nutrient retaining qualities, it is capable of growing good pasture when irrigated, and there is good quality and quantity of water for the irrigation of pasture.

Best management of manure is outlined in Van Gool D, K Angell and L Stephens, 2000, *Stocking Rate Guidelines for Rural Small Holdings Swan Coastal Plain and Darling Scarp*, Department of Agriculture.

Off Site Impacts

The potential off site impacts are possibly from dust, fly breeding and nutrient export. Nutrients are discussed above, and considering the soils on site and depth to groundwater, combined with a broad spread of nutrients across the site, there is not expected to be any change to the nutrient regime or risk of export. In fact these soils are good soils for the keeping of horses. The treatment of manure becomes the issue and is no different to the current requirements.

The main risk of a nutrient plume would be the disposal of all horse manure say in the south eastern corner of proposed Lot 10. Most owners are responsible and any issues associated with keeping of horses will be no different to any other property that keeps horses.

Fly breeding also remains a similar issue. Flies can potentially breed in manure.

Suggestions on manure management are contained in Van Gool D, K Angell and L Stephens, 2000.

ENVIRONMENTAL ISSUE	MANAGEMENT
Site Capability for Effluent Disposal	<ul style="list-style-type: none"> • Conventional septic systems are recommended to be inverted or semi inverted, and banded by natural soils on the down slope side or installed with an impermeable membrane setback from the side of the leach drain on the down slope side to assist in waste water penetrating the natural soils. • Alternative effluent systems are with waste water disposal areas to be sized according to underlying subsoil permeability. 10L/m² is regarded as acceptable. • Effluent disposal systems should not be located in potentially wet or potentially waterlogged areas, as shown on the attached plan.

4.0 Conclusions and Recommendations

Conclusions

1. The soils on this site are well suited to one hectare lots and the keeping of horses, because the soil profile has good nutrient retaining qualities and is capable of growing good pasture
2. The subdivision of Lots 22 and 23 into 21 lots of 1 hectare is unlikely to result in any environmentally significant land use changes or additional nutrient loading.
3. The remnant vegetation can be preserved and enhanced with strategic tree planting.
4. The subdivision of Lots 22 and 23 Lancaster Road, Albany is sustainable, with potentially minimal environmental impact.

Recommendations

1. Conventional septic systems are acceptable as are alternative waste water systems.
2. Generally locate dwellings and waste water systems out of the recommended exclusion areas, (see attached plan).
3. Plant the vegetation buffers according to the attached plan.

Lindsay Stephens

SOIL SUMMARY TABLES

Soil Characteristics	Sand over Clay Silts
Location	Southern crest of Plantagenet marine plateau
Origin	Marine silts spongolites and fine sands originally with some feldspathic and clay component, weathered and possibly redistributed on the surface by aeolian action.
Top soil Texture	Grey quartz sand grading to cream or white sand. Generally fine to medium grained
Sub soil Texture	Ferricrete layer at upper surface of underlying yellow silty clays and clay silts. Minor gravel and pisolites are present in the north east.
Rock in profile	Some hardened ferricrete in the south
Bedrock	Very deep, not applicable
Gravel	Gravel occurs in the profile in the north east and east
Hardpan	Ferricrete hardpan is present at depths of 300 plus mm
PH	Neutral to acidic
Salinity	Low
Soil Permeability	High, reducing in silty clay subsoils
Soil Shrinkage	Generally very low to low

Land Qualities	Sand over Clay Silts
Slope	Flat to gently sloping
Slope Stability	High
Wind Erosion Risk	Moderate to high if vegetation removed and plant cover is not maintained.
Water Erosion Risk	Low apart from small break of slope in the central south west
Drainage	Good apart from some minor perching of surface water in the south
Moisture Availability	Low to moderate
Water Logging	Nil apart from some minor perching of surface water in the south
Flood Risk	Nil apart from the weak drainage line in the south west
Surface Water - Availability/Quality	Nil
Ground Water - Availability/Quality	High estimated depth of 3 - 5 metres.
Salinity Risk	Very low
Microbial Purification	High due to the depth and nature of the sand and underlying silty beds. Reduced where the surface sand becomes saturated in winter and waste water does not penetrate but flows from the surface.
Water Pollution Risk	Low in the north to moderate along the southern edge
Phosphate Retention - profile	High due to the depth and nature of the silts, goethite and iron induration. Can be reduced where surface water runs off and detention times are small.
Nitrogen loss - Profile	Moderate to high based on the interpreted degree of anoxic conditions and estimated microbial activity in the soil profile. Can be reduced where surface water runs off and detention times are small.
Existing Degradation	Predominantly cleared

Development Capability	Sand over Clay Silts
Ease of Excavation	High over most of the site, but restricted by ferricrete in the central south east
House and Road Construction	High
Foundation Soundness	High AS 2870 Site Class A - S based on the presence of deep silty sand and Iron indurated subsoils. It is recommended to keep the building envelope on Lot 10 in the north western corner or north, away from the lower ground. See attached plan.
Effluent Disposal	Suitable for conventional inverted to semi-inverted septic systems and alternative systems
Water Supply	Scheme

REFERENCES and FURTHER READING

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- Dawes L and A Goonetilleke, 2001, *The importance of site assessment in designing effluent disposal areas*, Proceedings of the 2nd Australia and New Zealand Conference on Environmental Geotechnics - Geoenvironment, University of Newcastle, New South Wales.
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SUBDIVISION GUIDE PLAN
LOTS 22 & 23 LANCASTER ROAD
ALBANY

Application Area: Recreational Area
Recreational Area: Recreational Area
Building Exclusion Area: None
Areas and dimensions are subject to survey.

Site Area: 24,323.71 sq
 MINNVA Road Widening: 4.4 ha
 MINNVA Road: 1.75 ha
 Net Area: 18,169.99
 Yield: 18.16 L/ha @ 1.0 ha



SCALE 1:2500 31 MARCH 2008



GRAY & LEWIS
AND USE PLANNERS

Suite 5, 2 Hardy Street
South Perth, WA 6151
T (08) 9474 1722
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ADOPTED BY RESOLUTION OF THE CITY OF ALBANY AT
THE.....MEETING OF THE COUNCIL
HELD ON THE.....DAY OF.....200.....
C.E.O.....



View south west across the site



View south across Hole 3. Test Hole 3 contains yellow brown sand and silty clay



View to the south west past hole 10. Test Hole 10 contains yellow brown gravelly silt.



View towards the west of the site



PROPOSED SUBDIVISION
LOTS 22 & 23 LANCASTER ROAD
ALBANY



0 10 20 30 40 50 60m

SCALE 1:2500 16 NOVEMBER 2004

Regolith and Hydrological Logs

Lindsay Stephens BSc (Geology) MSc (Botany)
25 Heather Road Roleystone 6111
Phone 9397 5145 Fax 9397 5350

Project	Lancaster	Site Assessed by	L Stephens
Location	Lots 22 and 23 Lancaster Road, Albany	Date of Inspections	31 March 2004

Test Hole Number	1	Natural Surface		
Location	central north east	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description			Comments
0 - 120 mm	grey sand, medium to fine			
120 - 630 mm	brown loamy gravel with weak ferricrete cobbles			
630 - 950 mm	yellow brown clay with minor red brown mottles			
950 - 1250 mm	cream yellow clay with minor red brown pisolite			
Groundwater	Not intersected			
Comment				

Test Hole Number	2	Natural Surface		
Location	central north east	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description			Comments
0 - 90 mm	grey medium grained sand			
90 - 210 mm	light brown sand			
210 - 390 mm	yellow brown gravel			
390 - 500 mm	yellow brown			
500 - 740 mm	coarser yellow brown gravel			
740 - 1320 mm	yellow silty clay			
Groundwater	Not intersected			
Comment				

Test Hole Number	3	Natural Surface		
Location	central west	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description			Comments
0 - 110 mm	grey sand			
110 - 320 mm	light brown to brown sand			
320 - 620 mm	yellow brown laterite caprock			
620 - 740 mm	friable gravelly laterite			
740 - 1350 mm	yellow orange silty clay			ribbon to 25 mm
Groundwater	not intersected			
Comment				

Test Hole Number	4	Natural Surface		
Location	central south east	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description			Comments
0 - 100 mm	grey medium grained sand			
100 - 450 mm	laterite caprock			
450 - 930 mm	yellow gravelly sit clay			
930 - 1380 mm	light brown clay with red brown mottles			
Groundwater	not intersected			
Comment				

Regolith and Hydrological Logs

Lindsay Stephens BSc (Geology) MSc (Botany)
25 Heather Road Roleystone 6111
Phone 9397 5145 Fax 9397 5350

Project	Lancaster	Site Assessed by	L Stephens
Location	Lots 22 and 23 Lancaster Road, Albany	Date of Inspections	31 March 2004

Test Hole Number	5	Natural Surface		
Location	south east	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 400 mm	grey to white sand over very hard indurated sandy duricrust	could not penetrate		
Groundwater	not intersected			
Comment				

Test Hole Number	6	Natural Surface		
Location	south east	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 350 mm	grey to white sand over very hard indurated sandy duricrust	could not penetrate		
Groundwater	not intersected			
Comment				

Test Hole Number	7	Natural Surface		
Location	south west	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 60 mm	grey medium grained sand			
60 - 470 mm	sandy yellow to yellow orange ferricrete			
470 - 800 mm	yellow orange clayey silt			
800 - 1050 mm	yellow orange clayey silt with red mottles grading to silty clay			
Groundwater	not intersected			
Comment				

Test Hole Number	8	Natural Surface		
Location	south west corner	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 270 mm	pale grey sand			
270 - 480 mm	hard yellow orange silty ferricrete layer			
480 - 800 mm	yellow orange silty earth with minor gravel			
800 - 1070 mm	yellow orange earthy silt			
Groundwater	not intersected			
Comment				

Regolith and Hydrological Logs

Lindsay Stephens BSc (Geology) MSc (Botany)
25 Heather Road Roleystone 6111
Phone 9397 5145 Fax 9397 5350

Project	Lancaster	Site Assessed by	L Stephens
Location	Lots 22 and 23 Lancaster Road, Albany	Date of Inspections	31 March 2004

Test Hole Number	9	Natural Surface		
Location	central west	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 100 mm	pale grey sand			
100 - 950 mm	fine to medium white sand			
950 - 980 mm	orange brown ferricrete with organo ferricrete on top due to reduced drainage			
980 - 1300 mm	ferricrete yellow brown silt			
Groundwater	not intersected			
Comment				

Test Hole Number	10	Natural Surface		
Location	central north west	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 70 mm	grey sand			
70 - 280 mm	ferricrete yellow brown silty sand			
280- 700 mm	gravelly yellow brown silt			
700 - 1050 mm	orange clayey to earthy silt with red brown mottles			
Groundwater	not intersected			
Comment				

Test Hole Number	11	Natural Surface		
Location	north west corner	Base of Hole		
Test Hole Type	backhoe	Depth		
Diameter		Depth of static water level		
Depth	Description	Comments		
0 - 60 mm	grey sand			
60 - 180 mm	light brown sand			
180 - 770 mm	gravelly yellow to orange brown silty sand			
770 - 1050 mm	yellow brown to orange brown silty loam clay to clay.			
Groundwater	not intersected			
Comment				

APPENDIX F

Bushfire Management Plan (2018)

**Lot 9000 Lancaster
Road, McKail,
Albany
WA 6330**

Bushfire Management Plan



18/6/2018

Kathryn Kinnear

Bio Diverse Solutions

DOCUMENT CONTROL

TITLE

Title: Bushfire Management Plan - Lot 9000 Lancaster Rd, WA 6330.

Author (s): Kathryn Kinnear

Reviewer (s): David Congdon

Job No.: HD046

Client: Kelly Belfield

REVISION RECORD

Revision	Summary	Revised By	Date
Draft ID 13/07/2017	Internal QA Review	Bianca Theyer	13/7/2017
Draft ID 13/07/2017	Issued to client for review	K.Kinnear	13/7/2017
FINAL ID 18/06/2018	Issued as final following MRWA consultation	K.Kinnear	18/06/2018

The recommendations and measures contained in this assessment report are based on the requirements of the Australian Standards 3959 – Building in Bushfire Prone Areas, WAPC SPP3.7, Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017) and CSIRO's research into Bushfire behaviour. These are considered the minimum standards required to balance the protection of the proposed dwelling and occupants with the aesthetic and environmental conditions required by local, state and federal government authorities. They DO NOT guarantee that a building will not be destroyed or damaged by a bushfire. All surveys and forecasts, projections and recommendations made in this assessment report and associated with this proposed dwelling are made in good faith on the basis of the information available to the fire protection consultant at the time of assessment. The achievement of the level of implementation of fire precautions will depend amongst other things on actions of the landowner or occupiers of the land, over which the fire protection consultant has no control. Notwithstanding anything contained within, the fire consultant/s or local government authority will not, except as the law may require, be liable for any loss or other consequences (whether or not due to negligence of the fire consultant/s and the local government authority, their servants or agents) arising out of the services rendered by the fire consultant/s or local government authority.



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Executive Summary

Kelley Belfield through Harley Dykstra commissioned Bio Diverse Solutions (Bushfire Consultants) to prepare a Bushfire Management Plan to guide all future bushfire management for the proposed Structure Plan over (SP) Lot 9000 Lancaster Road, McKail WA.

Such planning takes into consideration standards and requirements specified in various documents such as Australian Standard (AS) 3959-2009, Western Australian Planning Commission (WAPC) Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017) and State Planning Policy 3.7 (WAPC, 2015). These policies, plans and guidelines have developed by WAPC to ensure uniformity to planning in designated “Bushfire Prone Areas” and consideration of the relevant bushfire hazards when identifying or investigating land for future development.

The subject site is located in a bushfire prone area as identified by the state wide publicly released Bushfire Prone Area Mapping (DFES, 2017). The Subject Site currently consists predominantly of Grassland Type G associated with grazing pastures with a small area of Woodland Type B in the centre of the site and areas of Low fuel/Non-vegetation around the two dwellings. External to the site is predominantly Grassland Type G with some areas of Scrub Type D, Shrubland Type C, Woodland Type B, Forest Type A and Low fuel/Non-vegetated scattered around.

Through a method 1 BAL Assessment (demonstrated as a BAL Contour Plan) it has been demonstrated that BAL 29 or less can apply to the lots either in Stage 1 or Stage 2 of development. BAL 19 can apply to the existing dwellings in the northern area of the subject site. BAL and AS3959 is to be implemented by the lot owners at building approval stages, it is not retrospective to the existing dwellings. Detailed BAL can be undertaken by an Accredited level 1 BAL assessor when the final placement of the building is known. The plan of subdivision, Stage 1 and Stage 2 does not require any clearing of vegetation to achieve BAL/AS3959 setbacks, some minor clearing associated with the construction of the new access road will be required to meet public road and intersection standards.

Asset Protection Zones (APZ) associated with BAL 29 or less are recommended to ensure internal lots with grassland areas can achieve a BAL 12.5. Setbacks for APZ areas will be dependent on final placement of dwellings on the lots. Any future plantings as shown in revegetation areas are to be to a APZ standard as outlined in this report. The developer will be responsible for implementing revegetation standards as per APZ standards. New lot owners are to conform to any planting on their lot for revegetation, screening or windbreaks to APZ standards. Development Exclusion (as identified in the plan of subdivision) assumes that although excluding building development/construction, these areas can have vegetation maintained to APZ requirements.

The possibility of Main Roads WA proposal to close Patricia Close onto Link Road will essentially make Patricia Close an extensive cul-de-sac which is to be avoided in bushfire prone areas. An EAW will be constructed along the eastern boundary of the SP to ensure that the residents have two access ways. Two Battle axe lots along the western area of the SP cannot be avoided and to overcome this have been located beside each other to allow for a 12m wide driveway access to the lots. Access standards are to meet the minimum requirements of WAPC guidelines as shown in Table 6. Assessment to the acceptable solutions has deemed the subject site compliant with Element 3 – Vehicular Access.

Reticulated water will be provided to the future residents and is to be installed as per WCWA technical standards and approved by CoA at subdivision clearance stages. The subdivision is fully complaint to this Acceptable Solution.

An assessment to the WAPC Guidelines for Planning in Bushfire Prone Areas (vers 1.3, 2017) Acceptable Solutions of the 4 bushfire protection criteria is summarised over the Page, see Table 1.

Table 1: Bushfire protection criteria applicable to the site

Element	Acceptable Solution	Applicable Yes/No	Meets Acceptable Solution
Element 1: Location	A1.1 Development Location	Yes	Compliant BAL 29 or less applied to new lots, existing dwellings are BAL 29.
Element 2: Siting and Design	A2.1 Asset Protection Zone	Yes	Compliant, all new and existing dwellings have APZ in BAL 29 or less. APZ standards as per WAPC (Appendix B) and are located within the lots.
Element 3: Vehicular Access	A3.1 Two Access Routes	Yes	Compliant, EAW to Lancaster Road regardless of outcome of Patricia Close.
	A3.2 Public Road	Yes	Compliant, meets minimum technical standards
	A3.3 Cul-de-sacs	Yes	Compliant, meets minimum standards connected by EAW to Lancaster Road.
	A3.4 Battle axes	Yes	Compliant, located beside each other to provide for wider access and meets minimum standards.
	A3.5 Private driveways	Yes	Compliant, meets minimum technical standards
	A3.6 Emergency Access Ways	Yes	Compliant, meets minimum technical standards
	A3.7 Fire Service Access Ways	No	N/A
	A3.8 Firebreaks	Yes	Compliant, to CoA Fire Management Notice.
Element 4: Water	A4.1 Reticulated areas	Yes	Compliant
	A4.2 Non-reticulated areas	No	N/A
	A4.3 Individual lots in non-reticulated areas	No	N/A

This BMP report provides details of the fire management strategies proposed to be implemented across the site as it is developed to ensure adequate protection of life, property and biodiversity assets. To ensure the mitigation measures are implemented responsibilities are outlined in Section 6 for the new lot owners, the developer and the City of Albany.

1. Introduction

Kelly Belfield, through Harley Dykstra commissioned Bio Diverse Solutions (Bushfire Consultants) on behalf of a client to prepare a Bushfire Management Plan (BMP) to guide all future bushfire management for the proposed subdivision of Lot 9000 Lancaster Road, McKail WA.

This BMP has been prepared to assess the subject site to the current and endorsed Guidelines for Planning in Bushfire Prone Areas Vers 1.3 (WAPC, 2017) and State Planning Policy 3.7 (WAPC, 2015).

Such planning takes into consideration standards and requirements specified in various documents such as Australian Standard (AS) 3959-2009, Western Australian Planning Commission (WAPC) Guidelines for Planning in Bushfire Prone Areas Vers 1.3 (WAPC, 2017) and State Planning Policy 3.7 (WAPC, 2015). These policies, plans and guidelines have been developed by WAPC to ensure uniformity to planning in designated “Bushfire Prone Areas” and consideration of the relevant bushfire hazards when identifying or investigating land for future development.

1.1. Location

Lot 9000 Lancaster Road (herein referred to as the Subject Site) is 19.8ha and located approximately 8km northwest of the Albany CBD in the suburb of McKail. The Subject Site is bound by Lancaster Road to the north, Link Road to the west, private rural properties to the south and a church (Free Reformed Church of Albany) to the east. The location of the Subject Site is shown on Figure 1.

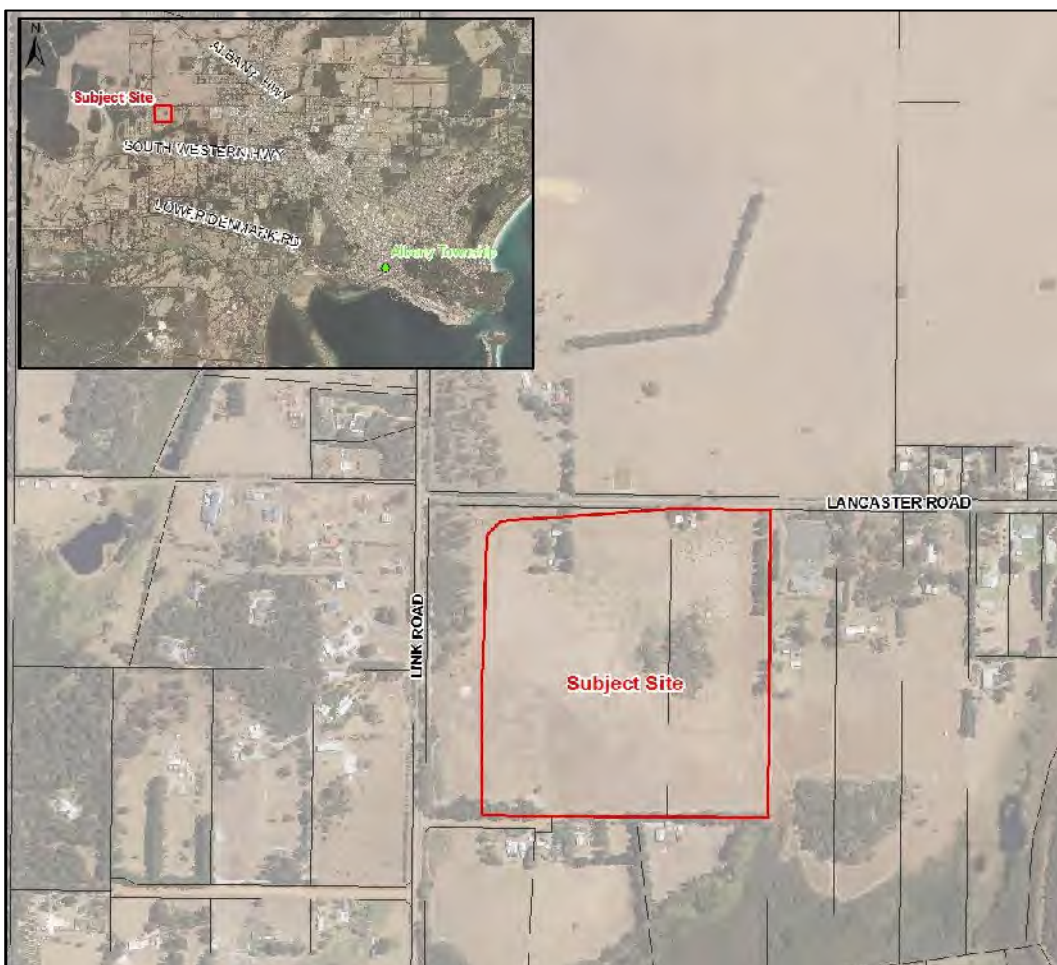


Figure 1: Location Plan

1.2. Development Proposal

The SP proposes the subdivision into 14 lifestyle size lots ranging in size from 1.0 to 2.0 ha and construction of public roads and an EAW (ceded as an easement in gross). The SP (Harley Dykstra, 2016) showing the proposed subdivision is presented in Appendix A. The subject site is currently zoned Rural Residential and located within Rural Residential Area No.34 (RR34) of the City of Albany Local Planning Scheme No. 1 (LPS1). This area allows for the subdivision of Rural Residential lots to a minimum lot size of 1 hectare, based upon land capability, service availability and other environmental constraints. The land immediately surrounding the property is zoned for various purposes including General Agriculture, Rural Residential and Future Urban in the City of Albany Local Planning Scheme No.1 (LPS1).

1.3. Statutory Framework

This document and the recommendations contained within are aligned to the following policy and guidelines:

- *Planning and Development Act 2005;*
- *Planning and Development Regulations 2009;*
- *Planning and Development (Local Planning Scheme) Regulations 2015;*
- State Planning Policy 3.7 Planning in Bushfire Prone Areas;
- Guidelines for Planning in Bushfire Prone Areas;
- *Building Act 2011;*
- *Building Regulations 2012;*
- Building code of Australia (National Construction Code);
- *Fire and Emergency Services Act 1998.*
- AS 3959-2009 “Construction of Buildings in Bushfire Prone Areas” current and endorsed standards;
- *Bushfires Act 1954;* and
- City of Albany Annual Fire Management Notice.

The publicly released Bushfire Prone Area Mapping (SLIP, 2017) shows that the majority of the Subject Site is located within a Bushfire Prone Area (situated within 100m of >1 ha of bushfire prone vegetation). Bushfire Prone Area Mapping is shown on Figure 2.

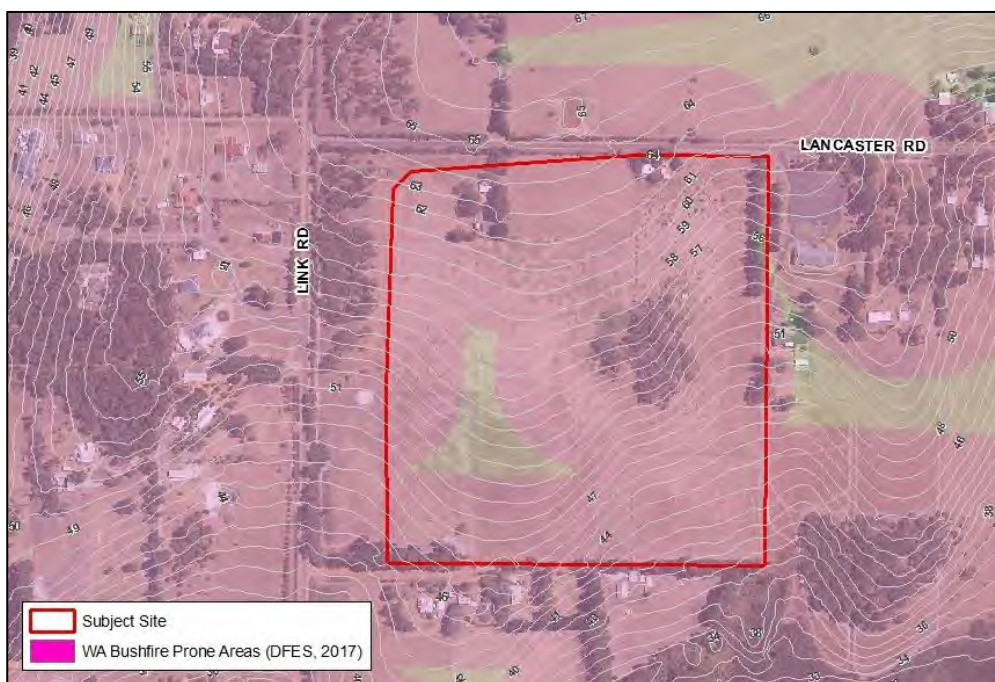


Figure 2: Bushfire Prone Area Mapping

1.4. Suitably Qualified Bushfire Consultant

This BMP has been prepared by Kathryn Kinnear (nee White), who has 10 years operational fire experience with the (formerly) DEC (1995-2005) and has the following accreditation in bushfire management:

- Incident Control Systems;
- Operations Officer;
- Prescribed Burning Operations;
- Fire and Incident Operations;
- Wildfire Suppression 1, 2 & 3;
- Structural Modules – Hydrants and hoses, Introduction to Structural Fires, and Fire extinguishers; and
- Ground Controller.

Kathryn Kinnear currently has the following tertiary Qualifications:

- BAS Technology Studies & Environmental Management;
- Diploma Business Studies; and
- Graduate Diploma in Environmental Management.

Kathryn Kinnear is an accredited Level 2 Bushfire Practitioner (Accreditation No: BPAD30794). Bio Diverse Solutions are Silver Corporate Members of the Fire Protection Australia Association. Kathryn is a member of the WA bushfire Working Group and is a suitably qualified Bushfire Practitioner to prepare this Bushfire Management Plan.

1.5. Objectives

The subject site is located in a bushfire prone area, SPP3.7 requires any development proposal to be assessed to the Guidelines for Planning in a Bushfire Prone Area (WAPC, 2017). The objectives of this BMP are to assess the bushfire risks associated with the existing site and the proposed subdivision to reduce the occurrence of, and minimise the impact of bushfires, thereby reducing the threat to life, property and the environment. It also aims to guide the SP design by assessing the proposed future subdivision according to the Bushfire Protection Criteria Acceptable Solutions as outlined in the Guidelines for Planning in Bushfire Prone Areas Vers 1.3 (WAPC, 2017).

The BMP aims to:

- Achieve consistency with objectives and policy measures of SPP 3.7 (WAPC, 2015);
- Assess any building requirements to AS3959-2009 (current and endorsed standards) and BAL Construction;
- Assess the subdivision proposal against the Bushfire Protection Criteria Acceptable Solutions as outlined in the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017);
- Understand and document the extent of the bushfire risk to the Subject Site;
- Prepare bushfire risk management measures for bushfire management of all land within the Subject Site with due regard to people, property, infrastructure and the environment;
- Nominate individuals and organisations responsible for fire management and associated works within the Subject Site; and
- Ensure alignment to the recommended assessment procedure which evaluates the effectiveness and impact of proposed, as well as existing, bushfire risk management measures and strategies.

2. Environmental Considerations

2.1. Native Vegetation

There is no internal site clearing required for this development, the area is previously grazed pasture paddocks. The construction of the new internal road connection will require some minor clearing of vegetation in Lancaster Road reserve (southern verge) for sight lines at the newly created intersection. This area is very degraded from previous verge/road reserve disturbances. A small section of trees are located in the centre of the SP in the future road reserve (north/south orientation) which will require to be removed.

It is not anticipated there will be a trigger of potential environmental impact/referral requirements under State and Federal environmental legislation.

2.2. Re-vegetation/Landscape Plans

There are no landscape plans or revegetation plans associated with this development. Replanting as shown on the SP will be to WAPC APZ standards. Any replanting on the lots will confirm to WAPC APZ standards, see Section 5.1 of this report.

3. Bushfire Assessment

3.1. Bushfire Assessment Inputs

A site inspection was conducted on the 23rd of May 2017 by Kathryn Kinnear to assess the current land use, topography/slope, vegetation and conditions of the site and its surroundings. Photographs of the Subject Site and surrounding areas were taken and have been presented in this report.

3.1.1. Land use

The site consists predominately of cleared rural land with a small area of remnant vegetation located in the central portion of the site. The Subject Site is used for grazing a variety of cattle, sheep and horses. There are two small homesteads located on the Subject Site adjacent to Lancaster Road. Both homesteads consist of a small house and a medium sized shed with the western most home also having a small shed. There is also one small shed/stable in the central eastern portion of the site. Land use on the Subject Site is shown on Photographs 1 to 4.



Photograph 1 – View looking into Subject Site from Lancaster Road.



Photograph 2 – View of eastern most homestead within Subject Site.



Photograph 3 – View of western most homestead within Subject Site.



Photograph 4 – View of remnant vegetation located in the central portion of the Subject Site. Unfenced and grazed.

3.1.2. Surrounding land uses

The Subject Site is surrounded by rural land to the north and south including three homesteads adjacent to the southern boundary of the site (off Patricia Clsoe), lifestyle lots to the west (west of Link Road) and a church (Free Reformed Church of West Albany) to the east. The surrounding areas are shown on Photographs 5 to 8.



Photograph 5 – View of rural land to the north of the Subject Site.



Photograph 6 – View of church to the east of the Subject Site.



Photograph 7 – View of lifestyle lot to the west of Subject Site.



Photograph 8 – View of homestead and rural land to the south of Subject Site.

3.1.3. Topography

The Subject Site generally slopes gradually from north to south, from a high point of 64m AHD along the northern boundary to 39m AHD in the south-east corner of the site. Topographic contours (1 metre contours) are shown on Figure 2.

The effective slopes (measured as per AS3959-2009) for the Subject Site are generally low ranging from 1.6 to 4.5 degrees. The effective slopes for surrounding areas are also low ranging from 1.4 to 1.8 degrees. The effective slopes for the Subject Site and surrounding areas are shown in Figure 3.

Slope under classifiable vegetation (Effective Slope) was assessed in accordance with Section 2.2.5 of AS3959-2009. Table 2 below summarises the slopes assigned to each plot of classifiable vegetation.

Table 2: Effective slope allocation to classified vegetation

Plot Number	Vegetation Classification	Effective Slope
1	Low fuel or non-vegetated areas Exc 2.2.3.2 (f)	N/A
2	Grassland Type G	Upslope
3	Scrub Type D	Upslope
4	Shrubland C	Upslope
5	Woodland Type B	Upslope
6	Woodland Type B	Downslope >0 to 5 degrees
7	Forest Type A	Upslope
8	Forest Type A	Downslope >0 to 5 degrees
9	Scrub Type D	Downslope >0 to 5 degrees
10	Grassland Type G	Downslope >0 to 5 degrees
11	Low fuel or non-vegetated areas Exc 2.2.3.2 (e)	N/A
12	Low fuel or non-vegetated areas Exc 2.2.3.2 (a)	N/A

3.1.4. Fire Danger Index

The Western Australian adopted FDI is 80 as outlined in AS3959-2009 and endorsed by Australasian Fire and Emergency Services Authorities Council. The FDI input for this project is also therefore 80.

3.1.5. Bushfire fuels – Vegetation

The subject site lies within the Jarrah Forest IBRA bioregion. Hearn et al (2002) describes the bioregion as; *'Duricrusted plateau of Yilgarn Craton characterised by Jarrah-Marri forest on laterite gravels and, in the eastern part, by Wandoo - Marri woodlands on clayey soils. Eluvial and alluvial deposits support Agonis shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands.'*

The vegetation has been mapped on a broad scale by J.S. Beard (Shepherd et al 2002) in the 1970's, where a system was devised for state-wide mapping and vegetation classification based on geographic, geological, soil, climate structure, life form and vegetation characteristics (Sandiford and Barrett 2010). A GIS search of J.S. Beards (DEC, 2005) vegetation classification places the Subject Site within two System and Vegetation Association (Source DEC Pre-European Vegetation GIS dataset, 2005):

The northern and central portion of the site is classified as;

System Association Name: Albany

Vegetation Association Number: 978

Vegetation Description: Low forest, jarrah, *Eucalyptus staeri*, *Allocasuarina fraseriana*

The southern portion of the site is classified as:

System Association Name: Albany

Vegetation Association Number: 51




Vegetation Description: Sedgeland, reed swamps, occasionally with heath



There are no Conservation Parks or Class "A" Reserves within the vicinity of the Subject Site.




The vegetation across the Subject Site and surrounding areas is consistent with rural farmland, with the majority of the site and surrounds comprising of heavily grazed pasture dominated by pasture grass species. There is a small patch of remnant vegetation located in the centre of the site dominated by sheoak trees with scattered jarrah trees and a grass/weed understory. There are small areas of forest lining the northern and southern boundaries of the site comprising of both remnant vegetation (eucalypt trees - Jarrah, Marri and Sheoak) and exotic plantings closer to neighbouring dwellings in the south. There is an area of scrub/ thicket consisting of *Agonis* and sedges adjacent to the south-east corner of the site and small patches of woodlands /forest slightly further from the site consisting predominantly of eucalyptus trees.



All vegetation within 150m of the site / proposed development was classified in accordance with Clause 2.3 and Exclusions as per Clause 2.2.3.2 of AS 3959-2009. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below. Each plot is representative of the Vegetation Classification to AS3959-2009 Table 2.3 and shown on the Vegetation Classification Mapping Figure 3, page 15.

Plot	1	Classification or Exclusion Clause	Exclusion –Low fuel or non-vegetated 2.2.3.2(e)
			<p>Location & Description: Roads, buildings and other hard stand areas surrounding subject area mostly external with the exception of the two existing dwellings adjacent to the northern boundary of the Subject Site.</p> <p><i>Clause (e) – Non-vegetated areas, including waterways, roads, footpaths, buildings and rocky outcrops.</i></p>
<i>Photo Id 1(top): View from Lancaster Road into the Church to the east of Subject Site.</i>			
Plot	2	Classification or Exclusion Clause	Grassland Type G
			<p>Location: External to the site north of Lancaster Road and to the east of the Subject Site.</p> <p>Separation Distance: 20-50m.</p> <p>Dominant species & description: Heavily grazed pasture, dominated by pasture grass species.</p> <p>Average vegetation height: 50–100mm.</p> <p>Surface fuel loading: 4.5 t/ha.</p> <p>Effective slope: Upslope.</p>
<i>Photo Id 2: North eastern view from Lancaster Road of property to the north.</i>			

Plot	3	Classification or Exclusion Clause	Scrub Type D
			<p>Location: External to the Subject Site to the north-east.</p> <p>Dominant species & description: Remnant roadside vegetation infested with pasture weeds.</p> <p>Separation distance: 16m.</p> <p>Average vegetation height: 3-4m (shrubs).</p> <p>Vegetation coverage: 10-30%.</p> <p>Surface fuel loading: <25 t/ha.</p> <p>Effective slope: Upslope.</p>
<i>Photo Id 3: View to the west along Lancaster Road adjacent to church driveway.</i>			
Plot	4	Classification or Exclusion Clause	Shrubland Type C
			<p>Location: External to the Subject Site located along the eastern end of the northern boundary.</p> <p>Separation distance: 0m.</p> <p>Dominant species & description: Watsonia infestation, interspersed with pasture grasses along the road reserve. Some connectivity to Plot 7.</p> <p>Average vegetation height: 0.7–1.5m.</p> <p>Surface fuel loading: 8 t/ha.</p> <p>Effective slope: Upslope.</p>
<i>Photo Id 4: View of Watsonia infestation along southern drain of Lancaster Road.</i>			
Plot	5	Classification or Exclusion Clause	Woodland Type B
			<p>Location: External to site adjacent to the north-western boundary of site.</p> <p>Separation distance: 58m.</p> <p>Dominant species & description: Sheoak dominant, not multilayered, grass and weed understory.</p> <p>Vegetation height: Tree height to 10m.</p> <p>Vegetation coverage: 10-30%.</p> <p>Surface fuel loading: 15-25t/ha.</p> <p>Effective slope: Upslope.</p>
<i>Photo Id 5: View from north western corner of Woodland Type B.</i>			

Plot	6	Classification or Exclusion Clause	Woodland Type B
			<p>Location: Internal to the site and external adjacent to the western boundary and along the southern boundary of the site.</p> <p>Separation distance: 0m to the south and internal and 15-50m to the west.</p> <p>Dominant species & description: Sheoak dominant with scattered Jarrah, not multilayered, grass and weed understory.</p> <p>Vegetation height: tree height to 10m.</p> <p>Vegetation coverage: 10–30%.</p> <p>Surface fuel loading: 15-25t/ha.</p> <p>Effective slope: Downslope >0-5 degrees.</p>
<i>Photo Id 6: View to the south-east of Woodland Type B from corner of Link Rd and Lancaster Rd.</i>			
Plot	7	Classification or Exclusion Clause	Forest Type A
			<p>Location: External to site along the northern and southern side of Lancaster Road and adjacent to the south-east corner of the Subject Site.</p> <p>Separation distance: 0-36m.</p> <p>Dominant species & description: Dominated by eucalypt trees (Jarrah, Marri and Sheoak), multilayered vegetation structure.</p> <p>Average vegetation height: 15m.</p> <p>Vegetation coverage: >30–70%.</p> <p>Surface fuel loading: 25-35t/ha.</p> <p>Effective slope: Upslope.</p>
<i>Photo Id 7: View of southern side of Lancaster Road looking east.</i>			

Plot	8	Classification or Exclusion Clause	Forest Type A
 			<p>Location: External to the site along the eastern edge of Link Road and adjacent to dwellings to the south of the Subject Site.</p> <p>Separation Distance: 0–80m.</p> <p>Dominant species & description: Roadside remnant vegetation, multilayered along Link Rd and windbreaks of eucalypt trees and exotic domestic plantings adjacent to dwellings.</p> <p>Vegetation height: 10–20m.</p> <p>Vegetation coverage: >30–70%.</p> <p>Surface fuel loading: 25-35t/ha.</p> <p>Effective slope: Downslope >0-5 degrees.</p>
<p><i>Photo 1d 8 (top): Looking east onto Patricia Close.</i></p> <p><i>Photo 1d 8a: View from southern boundary of Subject Site to the south of exotic planting around residences.</i></p>			
Plot	9	Classification or Exclusion Clause	Scrub Type D
			<p>Location: External to site located to the south east of Subject Site.</p> <p>Separation Distance: 0-16m.</p> <p>Dominant species and description: Scrub/ thicket of <i>Agonis</i> and sedges.</p> <p>Average vegetation height: 3–4m.</p> <p>Vegetation coverage: >30%.</p> <p>Surface fuel loading: 25t/ha.</p> <p>Effective slope: Downslope >0-5 degrees.</p>
<p><i>Photo 1d 9: Southern view towards Scrub Type D, south east of subject site.</i></p>			

Plot	10	Classification or Exclusion Clause	Grassland Type G
			<p>Location: Internal to site covering most of the Subject Site.</p> <p>Separation Distance: 0m.</p> <p>Dominant species and description: Heavily grazed pasture dominated by pasture grass species.</p> <p>Vegetation coverage: <10% trees.</p> <p>Average vegetation height: 50-100mm.</p> <p>Surface fuel loading: 4.5 t/ha.</p> <p>Effective slopes: Downslope >0-5 degrees.</p>
<p><i>Photo Id 10: View to the north west from south eastern corner of Subject Site. Note consistent gradient.</i></p>			
Plot	11	Classification or Exclusion Clause	Exclusion –Low fuel or non-vegetated 2.2.3.2(f)
			<p>Location: Maintained gardens and APZ areas associated with existing residential dwellings</p> <p><i>Clause (f) – Low threat vegetation including managed grassland in minimal fuel condition, maintained lawns, golf courses, maintained public reserves and parklands, vineyards, orchards, cultivated ornamental gardens, commercial nurseries, nature strips and wind breaks.</i></p> <p>Surface fuel loading: <2 t/ha.</p>
<p><i>Photo Id 1a: View to the south of the western residence within Subject Site.</i></p>			
Plot	12	Classification or Exclusion Clause	Exclusion –Low fuel or non-vegetated 2.2.3.2(a)
<p><i>No photo available</i></p>			<p>Location: Located to the east and west of the subject site.</p> <p>Description: Vegetation that is >100m from the subject site.</p> <p>As per exclusion clause 2.2.3.2 (a) of AS3959.</p>

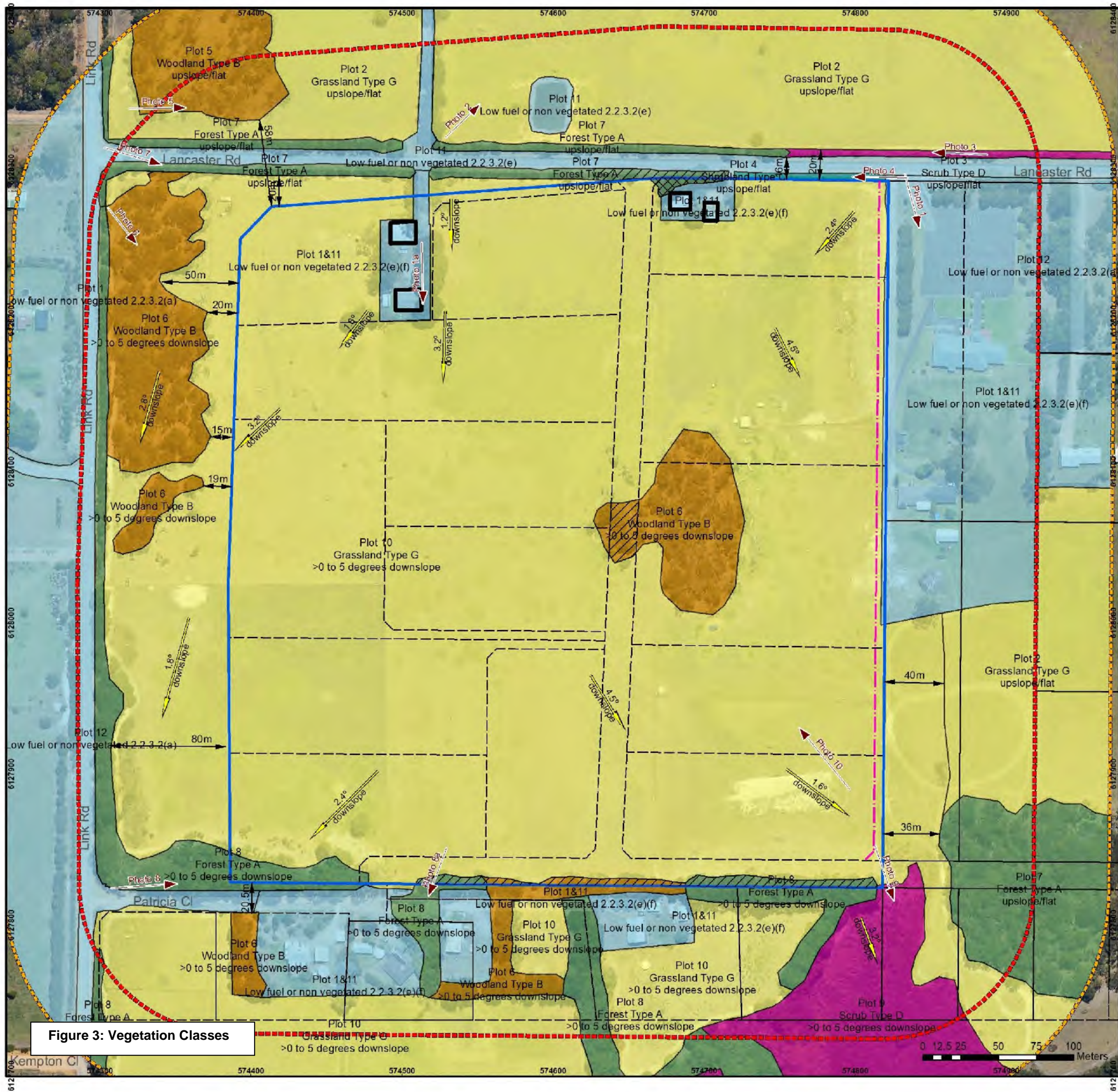


Figure 3: Vegetation Classes

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Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Existing Building
- Proposed Lots
- Manage to APZ requirements
- Fuel reduced/cleared
- ↗ Slope Degrees
- ↔ Separation Distance
- ▶ Photo ID
- Emergency Access-way (EAW)

Vegetation

- Forest Type A
- Woodland Type B
- Shrubland Type C
- Scrub Type D
- Grassland Type G
- Low fuel or non vegetated 2.2.3.2



Scale
1:2,500 @ A3
GDA MGA 94 Zone 50

Data Sources

Aerial Imagery: SLIP Virtual Mosaic WMS Service, Landgate 2017
Cadastral, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

CLIENT

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Vegetation Classes

BAL Assessor	QA Check	Drawn by
SW	BT	SA
STATUS	FILE	DATE
FINAL	HD046	6/06/2018

3.2. Bushfire Assessment - Outputs

Bushfire Attack Level (BAL) is the process in AS39598-2009 for measuring the severity of a building's potential exposure to ember attack, radiant heat and direct flame contact. The threat or risk of bushfire attack is assessed by an accredited BAL Assessor. BAL rating determinations are of 6 levels BAL-LOW, BAL-12.5, BAL-19, BAL-29, BAL-40, BAL FZ. Building is generally not recommended in BAL-40 or BAL-FZ areas. The BAL rating is determined by the distance of the building to vegetation, slope and vegetation type adjacent to the dwelling. Refer to Figure 4.



Figure 4: Building to BAL

Bushfire Attack Level (BAL) has been calculated using the Method 1 procedure as outlined in AS3959-2009. This incorporates the following factors:

- WA adopted Fire Danger Index (FDI);
- Vegetation Classes;
- Slope under classified vegetation; and
- Distance between proposed development site and classified vegetation.

The outcomes of the above inputs then allocate a specified BAL construction/setback for proposed buildings.

3.2.1. Method 1 BAL Calculation

A Method 1 BAL calculation (in the form of BAL contours) has been completed for the proposed development in accordance with AS 3959-2009 methodology. The BAL rating gives an indication of the level of bushfire attack (i.e. the radiant heat flux) that may be received by proposed buildings and subsequently informs the standard of building construction required to increase building tolerance to potentially withstand such impacts in line with the assessed BAL. The assessed BAL ratings for the development are depicted as BAL contours, BAL ratings for the Subject Site are presented in Table 3 with BAL Contours for the Subject Site shown on Figure 5.

Internal grassland areas have not been BAL Contoured with Grasslands Type G (Plot 10) still acknowledged by the Bushfire Practitioner as a bushfire risk. Setbacks to BAL and for APZ areas are to apply as depicted on the BAL Contour Plan.

All proposed new buildings can be located in areas subject to a BAL rating of BAL-29 or lower.

Table 3: BAL Allocation

Method 1 or 2 BAL Determination					
Lot	Vegetation Type (Table 2.3)	Slope (Table 2.4.3)	Distance to Vegetation (m)	Highest BAL Contour	Modified BAL Contour
1,2	Forest Type A (Plot 7)	Upslope	0-<100m	BAL FZ	BAL 29 on existing house
	Grassland Type G (Plot 10)	Downslope >0 to 5 degrees	9-<14m	BAL FZ	BAL29 can apply
3, 6 & 7 13	Grassland Type G (Plot 10)	Downslope >0 to 5 degrees	0-<100m	BAL FZ	BAL 29 to BAL 12.5 can apply
8, 4, 5, 11-13	Woodland Type B (Plot 6)	Downslope >0 to 5 degrees	13-<100m	BAL FZ	BAL 29 to BAL 12.5 can apply
	Grassland Type G (Plot 10)	Downslope >0 to 5 degrees	0-<50m	BAL FZ	BAL 29 to BAL 12.5 can apply
9 & 14	Forest Type A (Plot 8)	Downslope >0 to 5 degrees	0-<100m	BAL FZ	BAL 29 to BAL 12.5 can apply
	Grassland Type G (Plot 10)	Downslope >0 to 5 degrees	0-<50m	BAL FZ	BAL 29 to BAL 12.5 can apply
10	Shrubland Type C (Plot 4)	Upslope	0-<100m	BAL FZ	BAL 29 to BAL 12.5 can apply

Assumptions made in BAL Contour Mapping:

- The Subject Site will be developed according to the Structure Plan (Harley Dykstra, 2016) (Appendix A).
- The construction of the new internal road will require clearing of vegetation in Lancaster Road reserve and clearing on the southern verge for sight lines at the newly created intersection.
- All buildings to have BAL setback area (distance) maintained to APZ standards with the BAL allocation dependant on final placement of dwelling in the lots.
- Where multiple BAL allocations are shown on Table 3, the highest BAL is to apply to the building.
- The owner/developer of the Subject Site will maintain grasslands internal to the site at all times in a low fuel state (i.e. slashed to <100mm) for a minimum distance of 100m from any dwellings or construction areas.
- Internal Grassland areas (Plot 10) are excluded from the BAL Contour assessment and setback distances shown on the BAL Contour map to indicate requirements to achieve BAL-29 or below.

Note on internal grassland areas:

The lot contains significant areas of internal grasslands which are mapped as bushfire hazards (refer to Vegetation Classes Map). For practical purposes and to assist in identifying areas of 'least risk', the internal grasslands have been left off the BAL Contour Map (Plot 10). Setback distances to these areas are to be as per AS3959 and the following to apply:

Plot 10 – Grassland >0-5 degrees

9-<14m for BAL 29

14-<20m for BAL 19

20-<50m for BAL 12.5

When the final placement of the dwelling is known APZ areas are to apply as per the allocated BAL for the dwelling.

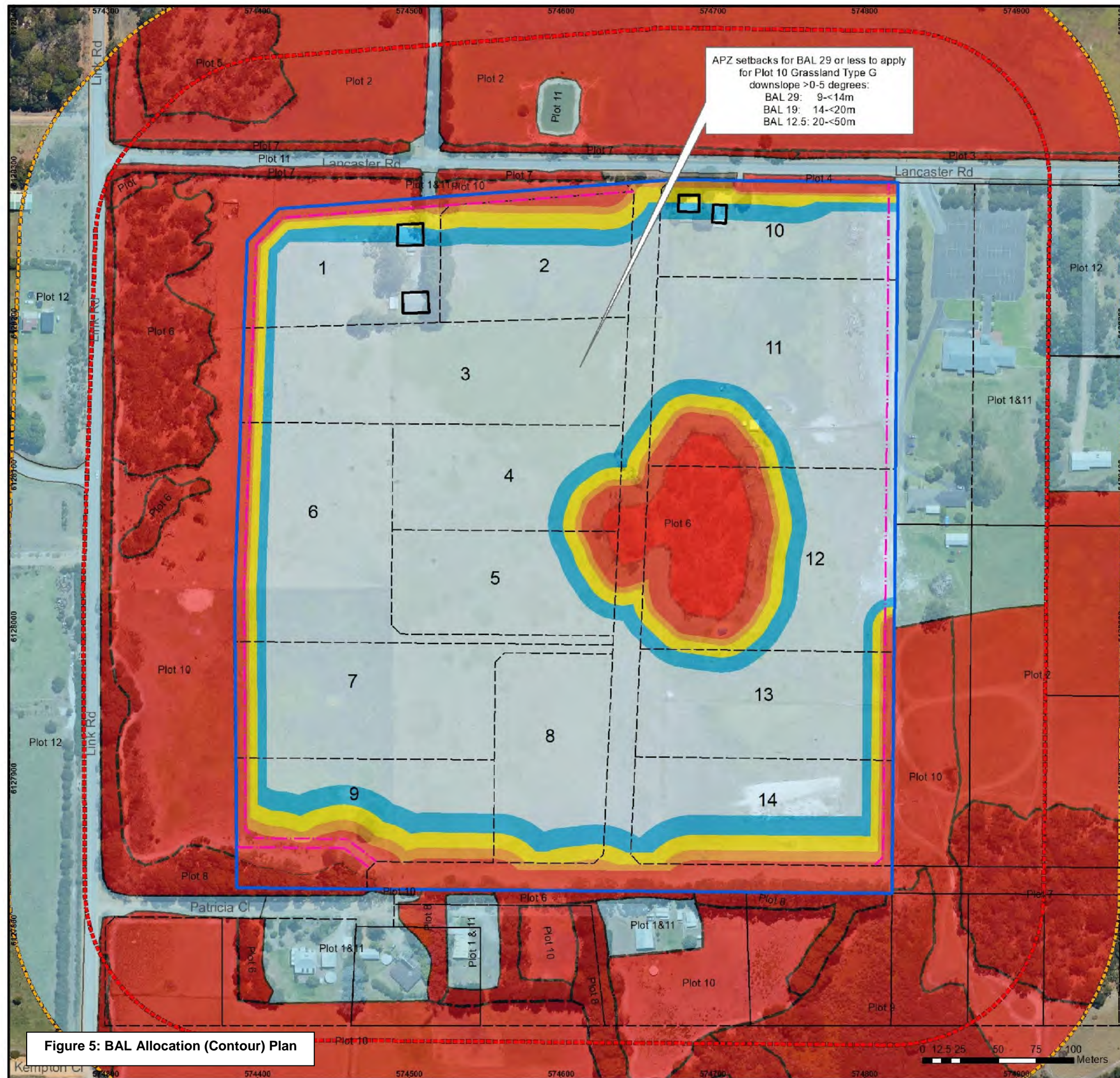


Figure 5: BAL Allocation (Contour) Plan

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Overview Map Scale 1:100,000

Legend

- Subject Site
- 100m Assessment Boundary
- 150m Assessment Boundary
- Proposed Lots
- Emergency Access-way (EAW)
- Existing Building

BAL Contours

- BAL-FZ
- BAL-40
- BAL-29
- BAL-19
- BAL-12.5



Scale
 1:2,500 @ A3
 GDA MGA 94 Zone 50

Data Sources
 Aerial Imagery: SLIP Virtual Mosaic WMS Service, Landgate 2017
 Cadastre, Relief Contours and Roads: Landgate 2017
 IRIS Road Network: Main Roads Western Australia 2017
 Overview Map: World Topographic map service, ESRI 2012

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BAL Contour Plan

BAL Assessor SW	QA Check BT	Drawn by SA
STATUS FINAL	FILE HD046	DATE 6/06/2018

4. Identification of bushfire hazard issues

4.1. Bushfire hazards

The subject site is located in a cleared agricultural landscape that has previously been used for grazing and stocking. Internal to the site the bushfire risks are associated with the grasslands and a small remnant patch of grazed Woodlands. These areas can be managed to APZ requirements depending on the final placement of buildings in the large lots.

External to the site the dominant bushfire risks are associated with the remnant Woodland areas to the north west and Forest Type A/Scrub Type B to the south. These areas present an “Extreme” Bushfire Hazards Level (BHL) (WAPC, 2017) and under hot and dry conditions expose the site from bushfire. Small isolated patches of Forest and Woodland occur to the south west and west of the subject site, however are separated by Moderate (grassland) BHL’s and although still deemed a bushfire hazard present lesser risks to the site. The upgrade and extension of Link Road to the west may involve further clearing of the future road reserve from MRWA, however the precautionary principle is used that the vegetation will remain “as is”.

4.2. Access Issues

The correspondence to date on access has revolved around Main Roads WA (MRWA) proposal to close Patricia Close onto Link Road, which will essentially make the SP and Patricia Close a long cul-de-sac. Cul-de-sacs are to be avoided in bushfire prone areas (dead end road). It is of the opinion that of the bushfire practitioner that the closure of Patricia Close places all residents in the area at unnecessary risk of bushfire.

Prior to finalisation of this bushfire management plan, extensive consultation occurred between the City of Albany, Main Roads WA (MRWA) and DFES regarding the potential closure of Patricia Close and the opportunity for this to be retained as a controlled Emergency Access Way (EAW) (can be gated and not locked) for residents in the event of a bushfire. Whilst the City of Albany supports this proposal, and have indicated they would be prepared to manage this EAW to ensure it is not used for other purposes, an agreement has not yet been finalised between MRWA and DFES for this to occur. Refer to correspondence Appendix C.

To overcome the access issue and bushfire risks associated with it, two options are proposed to ensure the Structure Plan complies with SPP 3.7, and enable MRWA and DFES to identify the most practical outcome for a secondary point of emergency access.

Option One identifies the retention of Patricia Close as an EAW. In the opinion of the bushfire practitioner, this is the preferred option as Patricia Close is an existing public road and this option would provide access and egress from the subject site onto both Lancaster Road and Link Road. The EAW would be gated, not locked and fitted with appropriate signage identifying it as an EAW. Additional signage could be fitted identifying penalties if it was used other than in the event of an emergency. Responsibility for the management of this would be vested with the City of Albany.

Option two provides for an EAW to be located along the eastern boundary of the site and linking onto Lancaster Road, to ensure that residents have two access ways available at all times. This EAW would be ceded as an easement in gross for unobstructed access for residents and fire services in the event of a bushfire emergency. The EAW would also be gated, not locked and fitted with appropriate signage identifying it as an EAW. The EAW along the eastern perimeter of the subdivision linking the public road network to Lancaster Road and enable two way linking access from Patricia Close/subdivision residents at all times. It shall be ceded as an easement in gross. The EAW along the eastern boundary fence is conceded not be ideal as the access ways onto Lancaster Road are only 165m apart.

Other options to the east and south to another public roads were investigated by the proponent. The ability of linking to Timewell Road (1km to the east) is not feasible as it crosses a creek and is Water Corporation reserve (for the wastewater treatment plant located on Timewell Road). To the south to Beaudon Road there are multiple landowners and again a creek (sensitive land area) to cross which inhibits the EAW in that direction.

Contact with adjacent land owners on the matter was pursued but not deemed viable from them. Refer to Access Mapping Figure 6 Page 21.

The Structure Plan illustrates two options available for to ensure two points of access are provided, and that it is able to comply with SPP 3.7. Following agreement between MRWA, DFES and the City of Albany, the preferred option can be implemented and the other option no longer required.

Two battle axe lots along the western boundary will be located side by side to enable a larger frontage/access into the lots (lot 6 and 7). All other lots have public road frontage. The driveway battle axes are not to be fenced between the two accesses to provide a 12m wide access route to the dwellings. This will allow for greater sight lines for fire services entering the lots in a bushfire emergency.

The battle axe lots cannot be avoided without making long narrow lots to adjoin the public road reserve which are not practical as the houses would be located close to each other in a predominantly cleared rural landscape. MRWA have indicated that there is limited/restrictive access and driveway cross overs onto the public road of Link Road. To the west Link Road is located (85m) which in the event of bushfire, access along that road can assist with fire services for bushfire mitigation actions to the west of the SP. Refer to the Access Mapping Figure 6, Page 21.



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Overview Map Scale 1:100,000

Legend

- Subject Site
- Existing Building
- Proposed Lots
- Cadastre
- Emergency Access-way (EAW)



Scale
1:6,000 @ A3
GDA MGA 94 Zone 50

Data Sources
Aerial imagery: SLIP Virtual Mosaic WMS Service, Landgate 2017
Cadastre, Relief Contours and Roads: Landgate 2017
IRIS Road Network: Main Roads Western Australia 2017
Overview Map: World Topographic map service, ESRI 2012

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Access Mapping

BAL Assessor	QA Check	Drawn by
SW	BT	SA
STATUS	FILE	DATE
FINAL	HD046	12/06/2018

5. Assessment to the bushfire protection criteria

The Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017) outlines bushfire protection criteria which subdivision and development proposals are assessed for compliance. The bushfire protection criteria (Appendix 4, WAPC, 2017) are a performance based criteria utilised to assess bushfire risk management measures and they outline four elements, being:

- Element 1: Location
- Element 2: Siting and Design of Development;
- Element 3: Vehicle Access; and ‘
- Element 4: Water.

(WAPC, 2017)

The Plan of subdivision(s) is required to meet the “Acceptable Solutions” of each Element of the bushfire mitigation measures (WAPC, 2017). The proposal will be assessed against the bushfire protection criteria Acceptable Solutions for Elements A1, A2, A3 and A4. A summary of the assessment is provided below in Table 4. The following sections of this report outlines how the proposal complies with the bushfire protection criteria Acceptable Solutions as per the Guidelines for Planning in Bushfire Prone Areas (WAPC, 2017).

The Subject Site was assessed against the bushfire protection criteria Acceptable Solutions for Elements A1, A2, A3 and A4. Please refer to Section 5.1.

5.1. Assessment to bushfire protection criteria – 4 elements

Table 5: Bushfire protection criteria applicable to the site

Element	Acceptable Solution	Applicable or not Yes/No	Subdivision meets Acceptable Solution
Element 1 – Location	A1.1 Development Location	Yes	<p>Compliant.</p> <p>The BAL Contour Plan (Figure 5) prepared demonstrates the BAL Contours (method 1 BAL Assessment) upon completed construction of the SP. The BAL Contour Plan demonstrates the future dwellings will be subject to BAL 29, BAL 19 and BAL 12.5 and no higher allocation of these BAL's will apply to the completed subdivision.</p> <p>The existing dwellings in the north of the SP (Lot 1 and Lot 10) can achieve BAL 29. AS3959 and the associated construction standards are to be implemented by the future lot owners at building approval stages, it is not retrospective to the existing dwellings.</p> <p>The plan of subdivision is deemed to be compliant with A1.1.</p>
Element 2 – Siting and Design	A2.1 Asset Protection Zone (APZ)	Yes	<p>Compliant.</p> <p>All future buildings can achieve an APZ area associated with a BAL allocation of BAL 29, BAL 19 or BAL 12.5. A minimum APZ area is recommended for all lots to ensure adequate setbacks to Grassland Type G is maintained (see annotation BAL Contour Plan for Plot 10). APZ setbacks associated with BAL allocation is to apply to individual buildings and is dependent on final placement of the dwelling on the lot. The existing houses (Lot 1 and Lot 10) are to maintain low fuel areas to APZ standards at all times.</p> <p>Staged development of the subject site is to incorporate maintenance of internal grassland areas to APZ requirements to 100m from any from any dwellings or construction areas. The developer will be responsible for maintenance of the site until ownership is relinquished to new lot owners.</p> <p>Any future replanting on lots are to be to WAPC APZ standards as outlined in this report. (See Appendix B). The developer will be responsible for implementing standards as per APZ standards in the balance of land in their ownership. New lot owners are to conform to any planting on their lot for gardens, screening or windbreaks to APZ standards.</p> <p>The plan of subdivision is deemed to be compliant with A2.1.</p>

Table 5 cont.

Element	Acceptable Solution	Applicable or not Yes/No	Subdivision meets Acceptable Solution WAPC 149702 & WAPC 149408
Element 3 – Vehicular Access	A3.1 Two Access Routes	Yes	<p>Compliant</p> <p>The Structure Plan illustrates two options available to ensure two access routes are provided. The Alternative access through to Link Road via an EAW on Patricia Close is presently not resolved. Refer to correspondence Appendix C. The closure of this public road will result in the subdivision and the residents along Patricia Close being located on a cul-de-sac which is not recommended in bushfire prone areas. Option one identifies the retention of Patricia Close as an EAW. Option two provides for an EAW to be located along the eastern boundary of the site and linking onto Lancaster Road. The EAW is to be a minimum of 6m wide to enable two way linking access from Patricia Close and the subdivision residents at all times. Refer to further detail in Element A3.6. All connections to the east and south were investigated by the proponent but were inhibitive due to either crossing a creek area (environmental issues) or had unresponsive landowners. Refer to further background information Section 4 of this report. Further consultation between DFES, MRWA and the City of Albany is required to identify the preferred option and removal of the alternative option. The SP is deemed compliant with A3.1</p>
	A3.2 Public Road	Yes	<p>Compliant</p> <p>All internal public roads shall be constructed with a minimum of 18m road reserves as depicted on the SP, meeting the minimum construction requirements. The vehicular access standards (Refer to Table 6 – Column 1) and relevant technical information shall be detailed in civil engineering designs at subdivision stage and approved by CoA. The SP is deemed compliant to Acceptable Solution A3.2.</p>
	A3.3 Cul-de-sacs	Yes	<p>Compliant</p> <p>Cul-de-sacs are proposed for this development and cannot be avoided due to the future (possible) closure of Patricia Close. The cul-de-sac will exceed the minimum length of 200m as required by WAPC guidelines, see Table 6, column 2. This however is a problem which has not been overcome through extensive consultation with DFES, CoA and MRWA. See Appendix C. A linking EAW will connect Patricia Close and the cul-de-sac in the subdivision along the eastern boundary to assist in achieving secondary/alternative access. Refer to further detail in Element A3.6. The cul-de-sac will require a minimum of 17.5m turnaround bulb as shown on the SP with all vehicular access standards (Refer to Table 6 – Column 1) and relevant technical information to be detailed in civil engineering designs at subdivision stage and approved by CoA. With the inclusion of an EAW along the eastern boundary connecting the cul-de-sac, the SP is deemed compliant to A3.3.</p>

Table 5 cont.

Element	Acceptable Solution	Applicable or not Yes/No	Subdivision meets Acceptable Solution
Element 3 – Vehicular Access cont.	A3.4 Battle axes	Yes	<p>Compliant</p> <p>Battle axes are not recommended in Bushfire Prone Areas. Two battle axe lots are required for the SP. This cannot be avoided as long narrow lots would need to be created in a (predominantly) cleared landscape. The widening and development of Link Road to the west has limited access and driveway cross overs in the future onto the public road of Link Road. The Battle Axe's are located beside each other and measure 146m (Lot 8) and 77m (Lot 7) which do not exceed the guidelines maximum of 600m. Battle axes are to be constructed with technical standards of a minimum of 6m wide and as per Table 6, Column 3. Battle Axes must comply with Acceptable Solution 3.4 via:</p> <ul style="list-style-type: none"> • Maximum length 600metres; • Minimum width 6 metres; and • Turn around area for fire appliances (type 3.4) to be made available at house sites (kerb to kerb 17m). <p>All widths of the battle axes comply to the minimum 6m wide horizontal clearance meeting the minimum requirements of Table 6, column 3. The two driveways are to be unfenced down the centre to allow for a total width of 12m battle axe legs. This will greatly assist with fire services access into the lots. As the driveways exceed 50m from a public road the new lot owners will need to ensure they have adequate turn around areas at the dwelling, refer to Figure 7 indicating compliant turn around areas. The SP deemed compliant to A3.4.</p>
	A3.5 Private driveways	Yes	<p>Compliant</p> <p>Private driveways will conform to the minimum technical standards as outlined in Table 6 – Column 3. As the driveways exceed 50m from a public road the new lot owners will need to ensure they have adequate turn around areas at the dwelling to accommodate heavy duty vehicles, refer to Figure 7 indicating compliant turn around areas. The driveways do not exceed 200m, therefore passing bays will not be required. The plan of subdivision is deemed compliant to Acceptable Solution A3.5.</p> <p>The plan of subdivision is deemed compliant to A3.5.</p>

Table 5 cont.

Element	Acceptable Solution	Applicable or not Yes/No	Subdivision meets Acceptable Solution
Element 3 – Vehicular Access cont.	A3.6 Emergency Access Ways cont.	Yes	<p>Compliant.</p> <p>A linking EAW along the eastern boundary of the SP will provide emergency access for residents and fire services in a bushfire emergency. It will also allow residents in the event Patricia Close is closed to public access, an alternative access to Lancaster Road. Refer to CoA correspondence confirming the EAW arrangement will meet their approval (Appendix C). The EAW will also link the cul-de-sac as shown on the SP. Although the EAW is along Lancaster Road (165m from the public road entry/egress point) other alternative options were investigated but proved to be unviable.</p> <p>The EAW is to be constructed by the developer at time of subdivision to a minimum of 6m wide horizontal clearance and 6m wide trafficable surface (noting the trafficable width can include a 4m wide paving with one metre wide constructed road shoulders), as per Table 6, column 4. The EAW is to be ceded as an easement in gross so is available for residents and fire services at all times. Signage on the EAW is to be approved by the CoA. Gates are to be a minimum 3.6m to accommodate heavy vehicles and are not to be locked. The minimum technical standards for the EAW are to be constructed in accordance with Table 6 Column 4 and is to be approved by the CoA prior to construction. Ongoing management of the EAW will be the responsibility of CoA. The SP is deemed compliant to this Acceptable Solution A3.6.</p>
	A3.7 Fire Service Access Ways	No	<p>Compliant</p> <p>Fire Service Access (FSA) Routes will not apply at this development. The public roads and EAW shall be used for Fire Services to access lots and alternative access linking back to Lancaster Road. Not assessed to Acceptable Solution A3.7.</p>
	A3.8 Firebreaks	Yes	<p>Compliant</p> <p>Firebreaks are in existence on the Subject Site and maintained regularly by the current owners. These will be maintained as per the CoA Fire Management Notice (updated annually) until developed. Individual future lot owners will be required with 3m perimeter firebreaks as per the CoA Fire Management Notice.</p> <p>The plan of subdivision is deemed compliant to Acceptable Solution A3.8.</p>

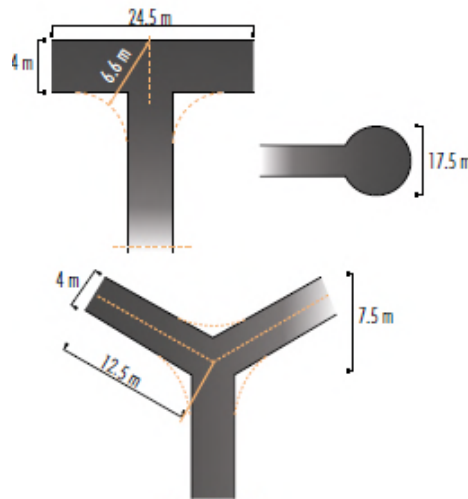
Table 5 cont.

Element	Acceptable Solution	Applicable or not Yes/No	Subdivision meets Acceptable Solution
Element 4 – Water	A4.1 Reticulated areas	Yes	<p>Compliant.</p> <p>The development will be provided with reticulated scheme water in accordance with the specifications of the relevant water supply authority (Water Corporation WA (WCWA)) and WAPC requirements. This will be detailed in the detailed engineering drawings and be subject to approval from WCWA and CoA at subdivision condition stages, meeting the Acceptable Solution. Fire hydrant (street) outlets are required, these must be installed to WCWA standards installed in accordance with the <i>Water Corporation's No 63 Water Reticulation Standard</i> and are to be identified by standard pole and/or road markings and installed by the Developer.</p> <p>Subdivision upon construction is deemed compliant to Acceptable Solution 4.1.</p>
	A4.2 Non-reticulated areas	No	Not assessed to A4.3.
	A4.3 Individual lots in non-reticulated areas	No	Not assessed to A4.3.

Table 6: Vehicular Access Technical Requirements (WAPC, 2017)

Technical requirements	Public Road	Cul-de-sacs	Private Driveways & Battle Axes	Emergency Access Ways (EAW)	Fire Service Access Ways
Minimum trafficable surface (m)	*6	6	4	*6	*6
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	4.5	4.5	4.5	4.5
Maximum grades	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
Maximum Length	N/A	200m	50m	600m	N/A

*Denotes the width can include a 4m wide paving with one metre wide constructed road shoulders



(WAPC, 2017)

Figure 7 – Design requirements for turnaround areas

5.2. Other fire mitigation measures

5.3. Evaporative air conditioners

Evaporative air conditioning units can catch fire as a result of embers from bushfires entering the unit. These embers can then spread quickly through the home causing rapid destruction. It can be difficult for fire-fighters to put out a fire in the roof spaces of homes.

It is also recommended that the lot owner (s):

- Ensure that suitable external ember screens are placed on roof top mounted evaporative air conditioners compliant with AS3959-2009 (current and endorsed standards) and that the screens are checked annually; and
- Maintain evaporative air conditioners regularly as per DFES recommendations, refer to the DFES website for further details:
<http://www.dfes.wa.gov.au/safetyinformation/fire/bushfire/pages/preparebeforetheseason.aspx>

5.4. Barrier Fencing

In November 2010 the Australian Bushfire CRC issued a "Fire Note" (Bushfire CRC, 2010) which outlined the potential for residential fencing systems to act as a barrier against radiant heat, burning debris and flame impingement during bushfire. The research aimed to observe, record, measure and compare the performance of commercial fencing of Colourbond steel and timber (treated softwood and hardwood).

The findings of the research found that:

".. Colourbond steel fencing panels do not ignite and contribute significant heat release during cone calorimeter exposure" (exposure to heat)

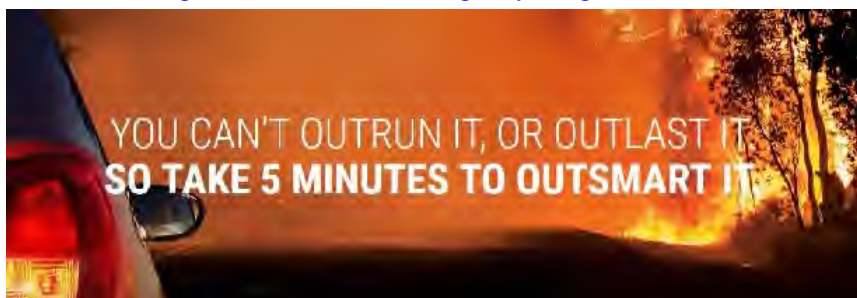
.."Colourbond steel (fencing) had the best performance as a non-combustible material. It maintained structural integrity as a heat barrier under all experimental exposure conditions, and it did not spread flame laterally and contribute to fire intensity during exposure"

It is also noted that non-combustible fences are recommended by WAPC (APZ standards: Fences and sheds within the APZ are constructed using non-combustible materials e.g. colourbond iron, brick, limestone, metal post and wire).

5.4.1. Individual Bushfire Plan

Residents should prepare their own individual fire plans, as they need to make a commitment to develop a bushfire survival plan detailing preparations and actions to take if a bushfire threatens. By compiling information as outlined above, the individual lot owner can be prepared for their response in a bushfire emergency. Home owners should not rely on emergency personnel to attend their home and thus it is stressed to prepare an individual bushfire emergency plan regarding their intentions and property. This Bushfire Management Plan is not an individual bushfire emergency plan. More information can be gained from the DFES website (s):

www.dfes.wa.gov.au and www.emergency.wa.gov.au



(DFES, 2018)



6. Responsibilities for implementation

6.1. Future Lot owner's Responsibility

It is recommended the future property owners shall be responsible for the following:

Table 7 – Implementation actions future lot owners

Future Lot owner– Ongoing management				
No	Implementation Action	Initial	Annual	All times
1	Build to AS3959 as it applies to their property	✓		
2	Maintain individual lot fuels and firebreak requirements in accordance with the City of Albany Fire Break Notice and WAPC APZ standards (Appendix B).		✓	
3	Construct driveway standards to Table 6.	✓		
4	Construct turnaround's at dwellings as per WAPC (Figure 7) standards if dwelling is located >50m from a public road.	✓		

Advice only : Residents should prepare their own individual fire plans due to be located in a bushfire prone area.

6.2. Developer's responsibility

It is recommended the developer be responsible for the following:

Table 8 – Implementation actions current land owners/developer

Developer – Prior to issue of titles		
No	Implementation Action	Subdivision Clearance
1	Ensure prospective buyers are aware of the certified BAL Contour Plan and the applicable BAL to their property through provision of BAL Contour Plan.	✓
2	Maintain balance of land in accordance with the CoA Fire Management Notice and the WAPC APZ standards as stated in the provisions of the BMP.	✓
3	Ensure any replanting on the SP is in accordance with the WAPC APZ standards (Appendix B).	✓
4	Construct all vehicle access in the subdivision to the minimum standards as outlined in Table 6.	✓
5	Construct EAW's during construction periods, ceded as an easement in gross.	✓
5	Install reticulated water to WCWA standards installed in accordance with the <i>Water Corporation's No 63 Water Reticulation Standard</i>	✓

6.3. Local Government Responsibility

It is recommended the local government be responsible for the following:

Table 9 – Implementation actions City of Albany

LGA– Clearance of conditions		
No	Implementation Action	Subdivision Clearance
1	Request for the update of the BAL contour plan and certification of BAL Contour prior to clearance of titles (post construction).	✓
2	Ensure vehicle access standards are achieved as per Table 6 and demonstrated in the civil engineering drawings.	✓
3	Ensure reticulated water is installed to WCWA standards and installed in accordance with the <i>Water Corporation's No 63 Water Reticulation Standard</i>	✓
4	Developing and maintaining District Fire Fighting Facilities and related infrastructure.	N/A, ongoing
5	Provide advice on standards and methods to achieve community fire protection to owners/occupiers of land through issue and enforcement of the current CoA Fire Management Notice (yearly advice brochure updated annually);	N/A, ongoing

7. References

AS 3959-2009 Australian Standard, *Construction of buildings in bushfire-prone areas*, Building Code of Australia, Primary Referenced Standard, Australian Building Codes Board and Standards Australia.

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Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2002) *Native Vegetation in Western Australia, extent Type and Status, Technical Report 249*, Department of Agriculture WA.

Western Australian Planning Commission (WAPC) (2017) Guidelines for Planning in Bushfire Prone Areas Version 3.1. Western Australian Planning Commission and Department of Planning WA, Government of Western Australia.

Western Australian Planning Commission (WAPC, 2015) State Planning Policy 3.7 Planning in Bushfire Prone Areas. Department of Planning WA and Western Australian Planning Commission.

State Land Information Portal (SLIP) (2017) Map of Bushfire Prone Areas. Office of Bushfire Risk Management (OBRM) data retrieved from: <https://maps.slip.wa.gov.au/landgate/bushfireprone/>

Western Australian Government Gazette, (2015) Monday 7 December 2015 No 183 Special. State Government of Western Australia

Appendices

Appendix A – Structure Plan

Appendix A – Subdivision Guide Plan



**Appendix B – WAPC APZ standards
to apply**

A2.1 Asset Protection Zone (APZ): every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:

- **Width:** Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat impact of a bushfire does not exceed 29kW/m² (BAL-29) in all circumstances.
- **Location:** the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in instances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity (see explanatory notes).
- **Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones'.

(WAPC, 2017)

An Asset Protection Zone (APZ) is an area surrounding a building that is managed to reduce the bushfire hazard to an acceptable level (WAPC, 2017). This is also defined as a "defendable zone". All buildings in the proposal area will have an APZ utilising Low threat or non-vegetated areas as classified by AS3959-2009 Section 2.2.3.2. Any replanting, revegetation and landscaping across the lots is to be to an APZ standard as per WAPC Guidelines Version (WAPC, 2017) as outlined below.

WAPC Guidelines for an APZ (WAPC, 2017)

Fences: within the APZ are constructed from non-combustible materials (e.g. iron, brick, limestone, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.

Objects: within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.

Fine Fuel load: combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.

Trees (> 5 metres in height): trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy. See Figure 9 (WAPC Figure 16, Appendix 4) below.

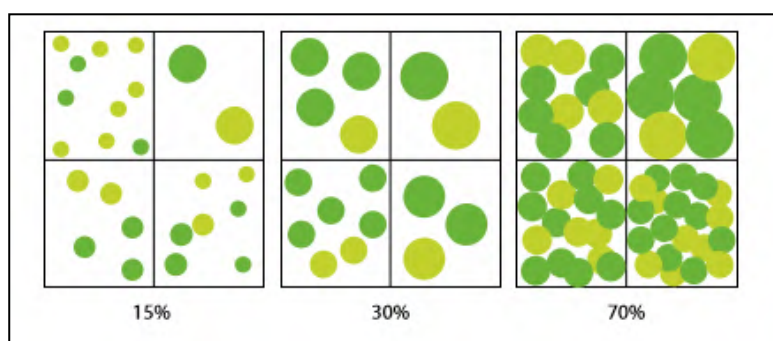


Figure 9: Tree Canopy Coverage – ranging from 15 to 70% at maturity (WAPC, 2017)

Shrubs (0.5 metres to 5 metres in height): should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.

Ground covers (<0.5 metres in height): can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors

if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.

Grass: should be managed to maintain a height of 100 millimetres or less.

(WAPC, 2017).

Appendix C – DFES and CoA Correspondence



Fri 20/04/2018 12:15 PM

DFES Advisory Services <advice@dfes.wa.gov.au>

Lot 9000 Lancaster Road Mckail - Local Structure Plan 7 - City seeking further clarification from DFES - DFES Response

To: Adrian Nicoll

Cc: Lewis, Kelsie; David Congdon; MYNOTT Naomi (SRPO) (Naomi.Mynott@mainroads.wa.gov.au); GRANT Chris (NOM)

Our Ref: D04030

Good afternoon Adrian

I refer to your email dated 28 March 2018 regarding consultation with the Department of Planning, Lands and Heritage (DPLH) in relation to access issues for the above structure plan.

The Department of Fire and Emergency Services (DFES) provide the following comments with regard to *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7) and the *Guidelines for Planning in Bushfire Prone Areas* (Guidelines) to aid in decision-making.

Assessment

It is disappointing that strategic planning of adjoining lots cannot be achieved, in seeking a solution for the subject site.

Whilst an emergency access way (EAW) is not a preferred option, DFES is satisfied that the intent of Element 3: Vehicular Access may be demonstrated with the provision of an EAW via Patricia Close to the proposed future Ring Road. Submission of this solution is required to be detailed in a revised BMP to demonstrate compliance. As the implementation of this matter is outside of our discretion, we will leave the decision regarding this solution to MRWA, the City and DPLH.

Advice

DFES has reviewed and provided informal advice relating to the above structure plan on 5 occasions (focused primarily on the issue of access). DFES have also liaised with DPLH and MRWA via teleconference to reach a solution.

DFES considers sufficient advice regarding the bushfire risk has been provided to aid the formulation of a structure plan for this site.

If the City and ultimately the Western Australian Planning Commission (WAPC) is of a mind to determine the draft proposals, DFES requests the opportunity to provide a formal response on the final version of the Structure Plan and supporting information.

Should you require clarification of the matters raised, please do not hesitate to contact me on 9482 1761.

Regards

Sandeep Shankar

Land Use Planning Officer | Advisory Services

Rural Fire Division | Department of Fire and Emergency Services

20 Southport Street, West Leederville 6007

E: advice@dfes.wa.gov.au P: 94821761 | W: www.dfes.wa.gov.au



Government of Western Australia
Department of Fire & Emergency Services





Mon 19/02/2018 11:22 AM

Adrian Nicoll <adriann@albany.wa.gov.au>

RE: Lot 9000 Lancaster Road Mckail - Local Structure Plan 7 - DFES Response

To David Congdon; Simona Damm

Cc GRANT Chris (NOM); MYNOTT Naomi (SRPO) (Naomi.Mynott@mainroads.wa.gov.au); DFES Advisory Services; Lewis, Kelsie

Follow up.

Hi David


Regarding structure planning for Lot 9000 Lancaster Rd.

Having received advise from MRWA and DFES, it's clear that Patricia Close is not available as an access route.

Whilst two access points from the subject lot to Lancaster may not meet the intent of A3.1, DFES is accepting of a secondary access to/from Lancaster Road through an expanded structure plan.

Both main and secondary access design/construction should meet the following:

TECHNICAL REQUIREMENTS	1 Public road
Minimum trafficable surface (m)	6*
Horizontal clearance (m)	6
Vertical clearance (m)	4.5
Maximum grade <50 metres	1 in 10
Minimum weight capacity (t)	15
Maximum crossfall	1 in 33
Curves minimum inner radius (m)	8.5



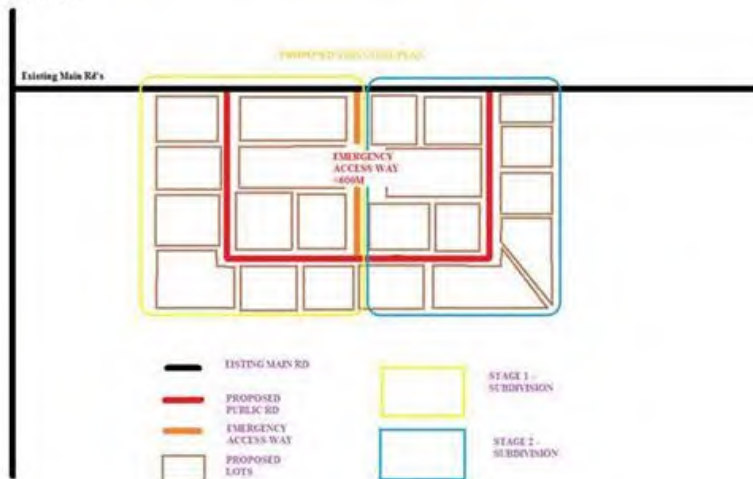
DFES have suggested that alternative access arrangements such as an 'Emergency Access Way' may be acceptable as part of a staged approach to subdivision. Please refer to requirements and indicative plan below:

A3.6 Emergency access way

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

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

Indicative Plan



In order to resolve issues regarding access, an expansion of the structure plan boundaries is required, to capture lots to the south and east to show the ultimate public road design.

Where possible:

- avoid the creation of battle-axe lots;
- avoid the creation of cul-de-sac;
- avoid the creation of dead ends.

Suggest we meet to discuss...

Kinds Regards

Adrian



Adrian Nicoll / Senior Planning Officer - Strategic Planning

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