

CITY OF SWAN
Structure Plan

WAPC Ref: SPN-2153M-2

City of Swan Ref: SWAN-S/-2017/5/B

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Original Approval Date: 13/05/2019

Latest Amendment Approval Date: 8/08/2024

Expiry Date: 13/05/2029

Disclaimer:

The City makes every attempt to keep its published records up to date; however the subject document may have been superseded by a more recently approved document.

Your ref: SWAN-SP/2017/5/B

Our ref: SPN/2153M-2

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Dear Sir/Madam

AMENDMENT APPROVAL - BULLSBROOK CENTRAL STRUCTURE PLAN AMENDMENT NO.2

WAPC REFERENCE: SPN/2153M-2

Pursuant to Schedule 2, Clause 22(1)(a) of the Planning and Development (Local Planning Schemes) Regulations 2015 (Regulations), the Western Australian Planning Commission (WAPC), on **08 August 2024**, granted approval to Amendment No. 2 to the Bullsbrook Central Structure Plan.

As the applicant, you are required to incorporate the Amendment into the Structure Plan. Once the amendment is incorporated, please provide a final copy of the complete Structure Plan (including spatial data in the format and manner specified in the Structure Planning Framework) as well as a separate document containing the updated Parts One and Two only, to the WAPC for endorsement and publication in accordance with Schedule 2, Clause 26 of the Regulations

The final amended document can be lodged via the Department of Planning Lands and Heritage's new electronic lodgement portal, Planning Online. Select the 'Other Lodgement' option and quote Lodgement ID: 2024-300481 when submitting the final modified document. The Planning Online portal can be accessed via the Department's website, or at <https://planningonline.dplh.wa.gov.au>

Yours sincerely



Ms Sam Boucher
Secretary
Western Australian Planning Commission

8 August 2024

AMENDMENT NO.2 TO
KINGSFORD
BULLSBROOK CENTRAL
LOCAL STRUCTURE PLAN
SEPTEMBER 2024



The Amendment to the Kingsford Central Local Structure Plan has been prepared under the provisions of the City of Swan Local Planning Scheme No. 17
The Amendment has been prepared by Hatch on behalf of the landowners Okeland Communities.

Title	Kingsford Local Structure Plan	
Prepared for	Okeland Communities	
Prepared by:	Hatch RobertsDay	
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Project Team:	Acoustic	Herring Storer
	Traffic and Transport	Transcore
	Servicing and Infrastructure	JDSi
	Surveyors	McMullen Nolan Group
	Landscape	Emerge Associates
	Environmental	RPS
	Aboriginal Heritage	Ethnoscience
	Retail Assessment	Taktiks4
	Bushfire	Strategen
	Hydrology	RPS
	Planning + Urban Design	Hatch RobertsDay

Revision	Comment	Author	Approved by	Date Issued
A	Draft for client review	TT	TT	August 2021
B	Final Version	TT	TT	September 2021
C	Final Version (A)	TT	TT	November 2021
D	WAPC Scheduled Modifications	TT	TT	August 2022
E	WAPC Scheduled Modifications	TT	TT	October 2022
F	WAPC Scheduled Modifications (Amendment No. 2)	TT	TT	September 2024

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Endorsement Page

This Structure Plan is prepared under the provisions of the City of Swan Local Planning Scheme No. 17.

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

08 August 2024

Signed for and on behalf of the Western Australian Planning Commission


.....

An officer of the Commission duly authorised by the Commission pursuant to Section 24 of the
Planning and Development Act 2005 for that purpose, in the presence of:

Table of Amendments

Amendment No.	Summary of the Amendment	Amendment Type	Date Approved by WAPC
1	- Extension of the Structure Plan area to include land to the east of the structure plan that had been identified for future indicative development but which now has been rezoned for urban development pursuant to the Metropolitan Region Scheme (MRS); - Contract the approved Bullsbrook Structure Plan area to exclude land that will comprise the Kingsford Town Centre Precinct Structure Plan; - Modify the existing Residential Density Codes indicated over various parts of the Structure Plan area by eliminating an area with an R40 coding and changing a 45ha area from R20-R50 to R20-R40; and - Reconfigure some areas of the proposed Public Open Space.	Standard	01 November 2022
2	- Change the designation on the Cafe site from 'Recreation' to 'General Commercial' zone with restricted uses. Include notation stating the permissible uses within the General Commercial zone are Cafe and Sales office, with all other uses restricted; - Update POS schedule and POS plan	Standard	08 August 2024

EXECUTIVE SUMMARY

The Kingsford Local Structure Plan (Structure Plan) has been prepared to guide the subdivision and development of Lots 1-6 & 1314 Great Northern Highway, Lots 2, 7-10, 900, 901 & 1396 Chittering Road, Lots 1165, 834, 433 and Part Lot 1343 Hurd Road, and Portion Lots 2792 & 1288 Taylor Road, Bullsbrook, within the City of Swan municipality. Implementation of a Structure Plan over this 207.32ha development site will assist in the delivery of strategic planning objectives set out by the State Government and the City of Swan in relation to housing supply, affordability and delivery of urban development.

The Structure Plan provides an overarching planning framework to guide and facilitate the development of the Structure Plan area for urban purposes, and has been prepared in accordance with the provisions of Part 5A.1 of the City of Swan Local Planning Scheme No.17, Planning and Development (Local Planning Schemes) Regulations 2015 and associated Structure Plan Framework.

The Structure Plan is aligned with the Bullsbrook Townsite District Structure Plan approved by the Western Australian Planning Commission (WAPC) in April 2018, which provides a high-level development framework for the broader locality through the allocation of land uses and service delivery.

The Structure plan provides for a range of residential densities and lot typologies, contributing to the availability of a diverse and affordable housing product within the North East Metropolitan Sub-Region. It also includes an integrated and legible movement network and generous provisions of public open space. It is anticipated that the LSP will accommodate approximately 2,355 lots and 2,355 dwellings, for a community of 6,947 residents.

The Structure Plan also provides the foundations for the development of the Kingsford Town Centre, which will provide a key employment and activity node within the City of Swan.

Development of the Structure Plan will be guided by Concept Plans prepared for each precinct. Encourages a diversity of households to live within Kingsford, both in design and affordability.

Kingsford Estate is the first major extension of the Bullsbrook Townsite identified in the 'Bullsbrook Townsite Land Use Management Plan (BLUMP)' endorsed in 2014 and associated MRS Amendments gazetted in late 2019.

The Kingsford project has commenced construction and will ultimately comprise over 2,355 homes, a Town Centre, District Open Space, Primary School and the re-alignment of Chittering Road. The project provides a number of critical community infrastructure elements necessary to support the long term growth of the expanded Bullsbrook

Executive Summary Table

ITEM	DATA	STRUCTURE PLAN REFERENCE
Total Kingsford Estate	207.32ha	
Area of each land use proposed (approx.):		
Residential:	108.41ha	
Private Clubs & Institutions (Church):	2.06 ha	
General Commercial	22.06 ha	
Public Open Space:	0.069 ha	
Core Creek Area:	13.20 ha	
1:1yr drainage:	1.9 ha	
Roads (inclusive of 'Primary Regional Roads' Reservation):	59.0 ha	
Total estimated lot yield	2,355 lots	
Estimated number of dwellings	2,355 dwellings	
Estimated residential site density	15 dwellings/gross urban zoned hectare 22 dwellings/site hectare	
Estimated population (based on 2.8 persons per dwelling)	6,947 people	
Number of high schools	0	
Number of primary schools	0	
Estimated number and % of public open space given over to:		
Regional Open Space	0 ha	
Neighbourhood Parks (>3,000m2):	15 parks @ 22.06ha (12% of total Structure Plan area)	
Local Parks (<3,000m2):	1 park @ 0.16 ha (~0.1% of total Structure Plan area)	

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- Appendix 1 Bushfire Management Plan -
Strategen JBS&G
- Appendix 2 Acoustic Assessment -
Herring Storer
- Appendix 3 Local Water Management Strategy -
RPS
- Appendix 4 Environmental Summary Report -
RPS
- Appendix 5 Transport Impact Assessment -
Transcore
- Appendix 6 Landscape Strategy -
Emerge
- Appendix 7 Engineering Service Report - JDSI

ABBREVIATIONS

AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment Conservation Council
ASS	Acid Sulfate Soils
AS	Australian Standard
BGL	Below Ground Level
BMP	Bushfire Management Plan
BRA	Bio-Retention Areas
BRT	Ellenbrook Bus Rapid Transit
CBD	Central Business District
CCW	Conservation Category Wetland
CoS	City of Swan
DAA	Department of Aboriginal Affairs
DER	Department of Environment Regulation
DPaW	Department of Parks and Wildlife
DoP	Department of Planning
DoW	Department of Water
EPA	Environmental Protection Authority
FSA	Flood Storage Areas
Ha	Hectare
LDP	Local Development Plan
LILLO	Left-in /Left-Out Road Intersection
LWMS	Local Water Management Strategy
MGL	Maximum Groundwater Level
MRS	Metropolitan Region Scheme
MRWA	Main Roads Western Australia
NESRF	Draft North-East Sub-Regional Planning Framework
OMSRS	Draft Outer Metropolitan Perth & Peel Sub Regional Structure Plan
POS	Public Open Space
PTA	Public Transport Authority
UWMP	Urban Water Management Plan
VPD	Vehicles per day
WAPC	Western Australian Planning Commission
WSUD	Water Sensitive Urban Design

PART 1

IMPLEMENTATION

1.0 Structure Plan Area

Kingsford Estate covers a total 207.32ha area, and is zoned 'Urban' under the Metropolitan Region Scheme (MRS).

This Local Structure Plan (LSP) applies to the land zoned 'Urban' under the MRS being Lots 1, 2, 3, 4, 5, 6 and 1314 Great Northern Highway, Lots 2, 7, 8, 9, 10, 900, 901 and 1396 Chittering Road, Lots 1165, 834, 433 and Part Lot 1343 Hurd Road, and Portion Lots 2792 & 1288 Taylor Road, Bullsbrook, being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map (refer Plan 1).

2.0 Operation

This Structure Plan comes into effect on the date on which it is approved by the Western Australian Planning Commission (WAPC) and is valid for a period of 10 years from that date, or another period determined by the WAPC in accordance with the Planning and Development (Local Planning Scheme) Regulations 2015 Schedule 2 – Deemed Provisions.

The Structure Plan is to be given due regard when making decisions on the development and subdivision of land within the Structure Plan area.

3.0 Staging

The development of the Structure Plan area will be implemented in multiple stages. The staging plan is indicative as timing, location and composition of the future stages will be dependent on market demand.

Stage 1, located within the north-western portion of the site, is currently under construction. The commencement of the project from this location has facilitated access to Chittering Road via upgraded roundabout intersecting with Maroubra Avenue and the development of the Display Village, Sales Office and 'first release' residential lots. The staging will now move eastwards to the north-south POS. Development will then progress and southwards with construction commencing for Stage 2 providing vehicle crossing of Ki-It Monger Brook. The staging will then continue south with a view to deliver the Kingsford Town Centre District Activity Centre, with potential to skip land parcels subject to individual landowner intentions.

The provision of engineering infrastructure and primary internal road network will also need to be staged to suit development demand and/or suitable access at an early stage. A detailed programme for this will be prepared as part of ongoing detailed planning and design of service infrastructure.

4.0 Subdivision and Development Requirements

Where land is zoned 'Urban' under the MRS and 'Residential Development' under the City of Swan Local Planning Scheme No. 17 (LPS17), the subdivision and development of land is to be generally in accordance with the Structure Plan (Plan 1).

4.1 Land Use Zones and Reserves

Land Use permissibility within the Structure Plan area shall be in accordance with the Structure Plan Map (Plan 1) and the corresponding Zones and Reserve under the City of Swan LSP17. Where there is a conflict with the Structure Plan and LSP17, the standards of LPS17 shall prevail to the extent of any inconsistency, in accordance with the Planning and Development (Local Planning Scheme) Regulations 2015 Schedule 2 – Deemed Provisions.

In the General Commercial zone (Restricted) a 'Cafe & Sales Office' are permissible land uses, with all other uses restricted.

4.2 Kingsford Town Centre

A Precinct Plan (PP) has been prepared for the Kingsford Town Centre, in accordance with State Planning Policy 4.2 for a 'District Centre' within the centre hierarchy, prior to the subdivision and development of land.

4.3 Hazards and Separation Areas

- Residential lots identified as a Bushfire Prone Area in the Bushfire Management Plan (Appendix 1) require a Bushfire Attack Level assessment and BAL Contour Plan to be prepared, in accordance with State Planning Policy 3.7, for an application of subdivision and/or development.
- Residential lots identified within the Transportation Noise Assessment (Appendix 2) require a Detailed Noise Assessment (customised noise mitigation measure to be implemented), in accordance with State Planning Policy 5.4, to be prepared and submitted with an application for subdivision and/or development where noise limit is likely to be exceeded.
- The landfill site, located in the southwestern portion of the Structure Plan area, is to be remediated prior to the subdivision and/or development of the land. All waste acceptance at the premises ceased in November 2018 and all waste processing was completed by the end of December 2020. Okeland Communities engaged Strategen JBSG / RPS to work with DWER on the licence surrender application / process. This process is ongoing with DWER. THE WAPC in their approval for the Lifting of Urban Deferment over the landfill land were advised applications for subdivision would not be lodged / considered until such time as the DWER Licence surrender process had been finalised.

4.4 Major Infrastructure

At the relevant time of subdivision, or as otherwise agreed, upon the advice of the City of Swan or Main Roads WA the following major infrastructure is to be constructed:

- a. Dual-lane roundabout at the intersection of the approved subdivisional road with Great Northern Highway;
- b. Upgrade of Maroubra Avenue, including intersection treatments, and the cul-de-sac of Chittering Road;
- c. Southern intersection with Great Northern Highway, the location and type of this intersection is subject to detailed design in consultation with affected landowners, Main Road and the City of Swan; and
- d. Suitable traffic management device(s) at the Alto Way/Hurd Road intersection.

4.5 Public Open Space

The provisions of a minimum 10% Public Open Space (POS) is to be provided in accordance with Liveable Neighbourhoods. POS is to be ceded free of cost to the Crown and vested for management to the City of Swan for the purpose of public open space. POS is to be provided generally in accordance with the Structure Plan (Plan 1) and Table 4 – Kingsford POS Schedule in Part Two of this report. An updated POS Schedule to be provided at the time of subdivision for determination by the WAPC, on the advice of the City of Swan.

Subdivision of Lot 2 will be subject to a separate contribute of Public Open Space, to the minimum 10% of the gross subdivisible area.

Ki-It Monger Brook core creek area is to be provided in addition to the 10% POS, and ceded free of cost to the Crown and vested for management to the City of Swan for the purpose of foreshore management and/or conservation.

4.6 Residential Development

4.6.1 Density Target

Residential densities application to the Structure Plan area shall be those densities shown on the Structure Plan Map (Plan 1).

Under Perth and Peel @ 3.5 million 'Connected City' scenario new urban areas are to use a minimum average residential target of 15 dwellings per gross hectare of Urban zoned land, and occupancy rate of 2.95 people per dwelling. The Structure Plan area complies, providing approximately 22 dwellings per ha.

Based on Liveable Neighbourhoods 'Site Hectare' definition, the Structure Plan 'developable area' equate to be developed for residential purposes and excludes non-residential land uses including streets, laneways and POS. Based on 2,355 dwellings, the Structure Plan estimates 22 dwellings per site hectare, this complies with LN target of 22 dwellings per site hectare.

4.6.2 Density Code Plans

The Structure Plan Map (Plan 1) defines the residential density ranges that apply to specific areas within the Structure Plan area.

A Residential Density Code Plan is to be submitted at the time of subdivision to the WAPC and will indicate the residential density code applicable to each lot within the subdivision consistent with the residential density code ranges identified on the Structure Plan (Plan 1) and location criteria contained in Clause 4.7.

Approval of the Density Code Plan is to be undertaken at the time of determination of the subdivision application by the WAPC. The approved Density Code Plan is to then form part of the Structure Plan and shall be used for the determination of future development applications.

Density Code Plans are not required if the WAPC considers that the subdivision is for one or more of the following:

- a. The amalgamation of lots;
- b. The purposes of facilitating the provision of access, services or infrastructure;
- c. Land which by virtue of its zoning or reservation under the Structure Plan cannot be developed for residential purposes; or
- d. Consolidation of land for 'superlot' purposes to facilitate land assembly for future development.

4.6.3 Locational Criteria

Residential densities applicable to the Structure Plan area are those residential densities shown on the Structure Plan (Plan 1).

The allocation of residential densities will generally be in accordance with the following location criteria:

DENSITY CODING	LOCATION CRITERIA
R5-R15 Precinct	
R5	The R5 density code applies to Residential zoned lots abutting/opposite land zoned Rural under the MRS and/or lots on the periphery of the LSP.
R10	The R10 density code applies as the base code to all Residential zoned lots, with the exception of those lots coded R5, R12.5 and R15 as set out below and above.
R12.5-R15	The R12.5 or R15 density code applies to Residential zoned lots abutting/opposite public open space.
R10-R30 Precinct	
R10	The R10 density code applies to Residential zoned lots abutting/opposite land zoned Rural under the MRS and/or lots on the periphery of the LSP.
R20	The R20 density code applies as the base code to all Residential zoned lots, with the exception of those lots coded R10 and R30 as set out above and below.
R25-R30	The R30 density code applies to Residential zoned lots where: - the lot is directly opposite/abutting public open space; or - the lot has a laneway abutting the rear boundary; or - the lot is located on a street block end.
R20 Precinct	
R20	The R20 density code applies, however lower densities may be provided to achieve bushfire requirements and/or where lots are located on steeply sloping land.
R20-R30 Precinct	
R20	The R20 density code applies as the base code to all Residential zoned lots, with the exception of those lots coded R30 as set out below.
R25-R30	The R30 density code applies to Residential zoned lots where: - the lot is within 100m of public open space; - the lot has a laneway abutting the rear boundary; or - the lot is located on a street block end.
R20-R40 Precinct	
R20	The R20 density code applies as the base code to all residential zoned lots, with the exception of those lots coded R30 and R40 as set out below.
R30-R40	The R30 density code applies to Residential zoned lots where: - the lot is located within a 100m walkable catchment of public open space; or - the lot is located within a 200m walkable catchment of a designated public transport route, or - the lot has a laneway abutting the rear boundary, or - the lot is located on a street block end. The R40 density code applies to Residential zoned lots where the lot is created within a 400m walkable catchment of the town centre.

Note: Lower densities may be acceptable to provide suitable interface/transition to existing development, to retain significant trees, to accommodate steep slopes or to address bushfire requirements

4.6.4 Future Residential Subdivision

Subdivision approval for residential lots will not be supported within 500m of the landfill facility until it has been remediated to the satisfaction of the Department of Water and Environmental Regulation.

5.0 Local Developments Plans

Local Development Plans (LDPs) are to be prepared in accordance with Part 6 of the Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 – Deemed Provisions. LDPs may be required as a condition of subdivision approval for lots comprising one or more of the following site attributes:

- a. Lots with an area of 260m² or less;
- b. Irregular shaped lots;
- c. Lots with an interface with, or outlook to POS;
- d. Lots that obtain vehicular access from a laneway or right-of-way;
- e. Lots that propose grouped or multiple dwelling development;
- f. Lots affected by transport noise which exceeds the noise target as defined by the State Planning Policy 5.4 in relation to Great Northern Highway and Chittering Road; and
- g. Lots affected by Bushfire Hazard, as identified by the Bushfire Management Plan (refer Appendix 1).

LDPs will generally be prepared to address one or more of the following:

- a. Building orientation;
- b. Building design and setbacks;
- c. Overlooking and/or privacy;
- d. Vehicle access;
- e. Car parking;
- f. Private open space;
- g. Interface with POS (fencing, frontage, footpath location);
- h. Noise protection provisions (if any);
- i. Bushfire protection provisions (if any);
- j. Laneway treatments; and
- k. Any such information considered relevant by the proponent and/or determining authority to address the requirement of this Structure Plan.

6.0 Residential Design Code Variations

The City of Swan Local Planning Policy POL-LP-11 Variation to Deemed to Comply Requirements of the R-Codes – Medium Density Single House Development Standards (R-MD Codes) sets out acceptable variation to the deemed-to-comply provisions the R-Codes for lots coded R25-R60. Except where an approval Local Development Plan (LDP) varies the ‘Deemed-to-Comply’ provisions of the R-Codes, the standards set out in Local Planning Policy POL-LP-11 shall apply to this Structure Plan.

In the instance where R35 density code applies the lot will be subject to the R30 R-MD Code provisions, R50 code lots will be subject to the R40 R-MD Code provisions.

7.0 Other Requirements

7.1 Notifications on Title

In respect of applications for the subdivision of land the City of Swan may recommend to the Western Australian Planning Commission that a condition be imposed on the granting of subdivision approval for a notification to be placed on the Certificate(s) of Title(s) to advise of the following:

- a. Construction standards to achieve higher noise standards in accordance with State Planning Policy 5.4 Road and Rail; Transportation Noise and Freight Considerations in Land Use Planning.
- b. Building setbacks and construction standards to achieve a Bushfire Attack Level -29 or lower in accordance with Australian Standards (AS3959-2009): Construction of buildings in bushfire prone areas.

7.2 Development Contributions

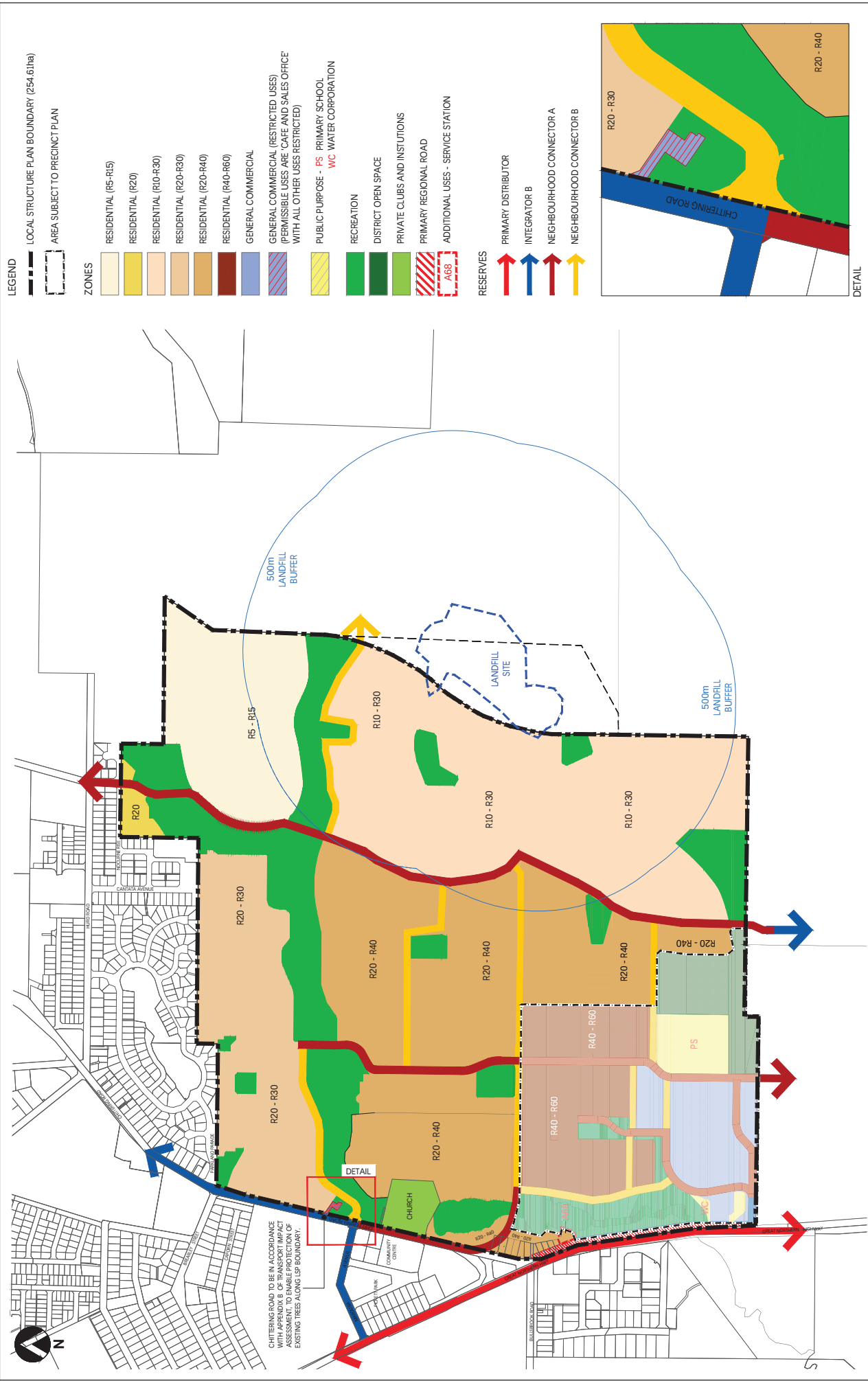
The Structure Plan area will be subject to a Development Contribution Plan (DCP) pursuant to LPS17 and guided by State Planning Policy 3.6 – Development Contributions for Infrastructure. The DCP will generally be guided by documents including, but not limited to, the following:

- a. Local Structure Plans and associated appendices;
- b. City of Swan Transport Strategy; and
- c. Bullsbrook Townsite Land Use Master Plan (BTLUMP).

The landowner will be liable to make a contribution toward the costs of providing infrastructure in the DCP at the time and in the circumstances as established through subsequent amendment to the Scheme or other agreed legal arrangement in the interim.

8.0 Additional Information

ADDITIONAL INFORMATION	APPROVAL STAGE	CONSULTATION REQUIRED
Density Code Plan	Subdivision application	WAPC City of Swan
Public Open Space Schedule	Subdivision application	City of Swan
Detailed Noise Management Plan	- Subdivision application/condition of subdivision for identified lots, or - Development application for identified lots.	City of Swan
Bushfire Attack Level Assessment	- Subdivision application/condition of subdivision for identified lots, or - Development application for identified lots	City of Swan Department of Fire and Emergency Services
Urban Water Management Plan	Condition of subdivision	City of Swan
Ki-It Monger Brook Foreshore Management Plan	Condition of subdivision for relevant landowner/stage adjacent foreshore	City of Swan
Wetland Management Plan	Condition of subdivision for relevant landowner/stage adjacent mapped wetland	City of Swan Department of Biodiversity, Conservation and Attractions

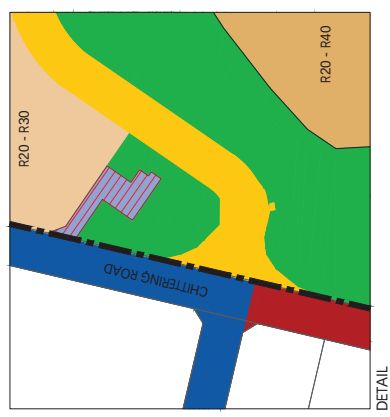


LEGEND

LOCAL STRUCTURE PLAN BOUNDARY (254.61ha)

AREA SUBJECT TO PRECINCT PLAN

- ZONES
- RESIDENTIAL (R5-R15)
 - RESIDENTIAL (R20)
 - RESIDENTIAL (R10-R30)
 - RESIDENTIAL (R20-R30)
 - RESIDENTIAL (R20-R40)
 - RESIDENTIAL (R40-R60)
 - GENERAL COMMERCIAL
 - GENERAL COMMERCIAL (RESTRICTED USES) (PERMISSIBLE USES ARE 'CAFE AND SALES OFFICE' WITH ALL OTHER USES RESTRICTED)
 - PUBLIC PURPOSE - PS PRIMARY SCHOOL
 - WC WATER CORPORATION
 - RECREATION
 - DISTRICT OPEN SPACE
 - PRIVATE CLUBS AND INSTUTIONS
 - PRIMARY REGIONAL ROAD
 - ADDITIONAL USES - SERVICE STATION
 - A68
- RESERVES
- PRIMARY DISTRIBUTOR
 - INTEGRATOR B
 - NEIGHBOURHOOD CONNECTOR A
 - NEIGHBOURHOOD CONNECTOR B



HATCH

SIZE A3
1:10,000
0 100 200 300 400 500 metres

DISCLAIMER: ISSUED FOR DESIGN INTENT ONLY. ALL AREAS AND DIMENSIONS ARE SUBJECT TO DETAIL DESIGN AND SURVEY

CADASTRAL INFORMATION
SOURCE: MING
YIMMDD: 220520
DWG REF: 8779706s-9999b-PCG94
PROJECTION: PCG94

24/08/11 58 TT
23/12/20 58 KB
23/06/19 58 TT
22/10/07 16 TT
22/06/03 58 TT
21/09/30 58 TT
YIMMDD DRAWN APP'D

Z.9 TEXT MOD TO LEGEND
Z.2 REUSE GENERAL COMMERCIAL ZONE [CAFE]
Z.1 ADD GENERAL COMMERCIAL ZONE [CAFE]
Z ADJUST LANDFILL BUFFER
Y MODIFY DENSITIES
X MODIFY DENSITIES
REV DESCRIPTION

KINGSFORD LOCAL STRUCTURE PLAN
Bullsbrook
City of Swan

REF. NO. AMX BUL
DRAW NO. RDI 107
REV. Z.3

PART 2

EXPLANATORY

1.0 Introduction

1.1 Purpose

The Kingsford Local Structure Plan (Structure Plan) has been prepared by RobertsDay and the project team on behalf of Okeland Communities (the developer). The purpose of the Structure Plan is to guide the orderly and proper subdivision and development of the Structure Plan area for ‘urban’ purposes, in line with the Bullsbrook Townsite District Structure Plan.

The Structure Plan is prepared in accordance with the requirements of Planning and Development (Local Planning Schemes) Regulations 2015 and the Western Australian Planning Commission (WAPC) Structure plan Framework, with regard to the City of Swan Local Planning Scheme No. 17 (LSP17) – Part 5A.

1.2 Project Vision & Objectives

The project vision and objectives for the Structure Plan will provide the overarching principles that guide the design, planning and place making development efforts. Located in the foothills of the Darling Scarp, views and green links to the Scarp are a key place identifier for the region providing bush backdrop.

Project Vision:

“Immersed in the captivating foothills, Kingsford celebrates the past and embraces the future to create an authentic urban village that is hallmarked by rich characters, a progressive outlook and engaged community”

– Okeland Communities

Project Objectives:

Creating Community Well-Being

- Authentic neighbourhoods and values;
- Healthy living, green walking and cycling links;
- New Town Centre as extension of existing town and community facilities;
- Highly connected green space and street network;
- Engaged community on-show through diverse activities, particularly on main street;

Inspired by Nature

- Ki-It Monger Brook celebrated as the lifeblood of Kingsford;
- Streets and houses oriented to capture breath taking views of the Darling Scarp;
- Natural landform retained for district sense of place and views as far as the City;
- Tree retention within public spaces and streets;

Character Rich

- Ki-It Monger Brook heritage discovery trails celebrating Indigenous and European site history;
- Contemporary, rural village-feel town centre;
- Adventure destination park, showcasing Bullsbrook’s aviation history;
- Elevated larger lots and country lifestyle choices;
- Attention to detail and design quality throughout;

Progressive

- Advantages of contemporary urban living within a country setting;
- Environmentally sustainable and economical lifestyle choices;
- Education and health at the heart of the community;
- Design that prioritise walking and cycling;
- Urban places and space for knowledge exchange.

1.3 Land Description

1.3.1 Location

The Structure Plan area is located within the municipality of the City of Swan and in the locality of Bullsbrook, Perth which is approximately 40km north-east of the Perth CBD and 25km north of the Midland Town Centre (refer Figure 1.).

The Bullsbrook locality is well serviced by a number services and communities facilities which will provide immediate benefit to future residents including: Bullsbrook High School (Bullsbrook College), Pickett Park Oval, Bullsbrook Public Library, Ethel Warren Bullsbrook Community Centre, RSL Branch, Bullsbrook Community Kindergarten, Chequers Golf Club, as well as a number of sporting clubs, youth facilities, skate park, BMX track, tennis courts and bridle trail, all within close proximity to the Structure Plan area.

The improvement to the surrounding transport connections, including NorthLink (Perth to Darwin Highway), Great Northern Highway and Stock Road extensions have and will improve the traffic flow and accessibility of the Bullsbrook locality from central Perth.

Key employment areas within the sub-region include the well-established Strategic Metropolitan Centre at Midland (which is accessible by the Perth–Midland passenger rail line), the emerging Ellenbrook secondary centre, industrial centres at Malaga, Forrestfield and Hazelmere and attractors such as the Swan Valley and the Avon Valley. The area is also supported by Bullsbrook South industrial area and Muchea employment node, which provides service-based land uses such as transport, livestock, fabrication, warehousing, wholesaling and general commercial use. The viticulture and tourism related industries in the Swan Valley will continue to grow and contribute to employment provision and economic growth within the sub-region. In addition, the sub-region has established regional links to, employment nodes at Perth Airport, Kewdale and the Morley and Cannington strategic metropolitan centres.

The Royal Australian Air Force base (RAAF) which is west of the Structure Plan area, has played a key economic driver for Bullsbrook since the 1940s with strong community ties. The base is now supported by an industrial park which benefits from the passing trade of Great Eastern Highway. This industrial area is anchored by the Bullsbrook Townsite which provides daily needs such as IGA, bank, pharmacy and service station.

1.3.2 Area and Land Use

The Structure Plan area is generally bound by Chittering Road and Great Northern Highway to the west, private landholdings to the south and east, and existing residential development to the north.

The Structure Plan area encompasses 254.6ha comprising largely cleared land, historically used for agricultural purposes, namely cattle and sheep grazing with limited environmental value. An existing homestead and associated outbuildings are located centrally within the Structure Plan. Remnant vegetation is primarily located along Ki-It Monger Brook, an existing seasonal creek line which traverses east-west centrally through the Structure Plan area.

1.3.3 Legal Description and Ownership

The Structure Plan encompasses the following landholdings:

The Structure Plan area comprises:

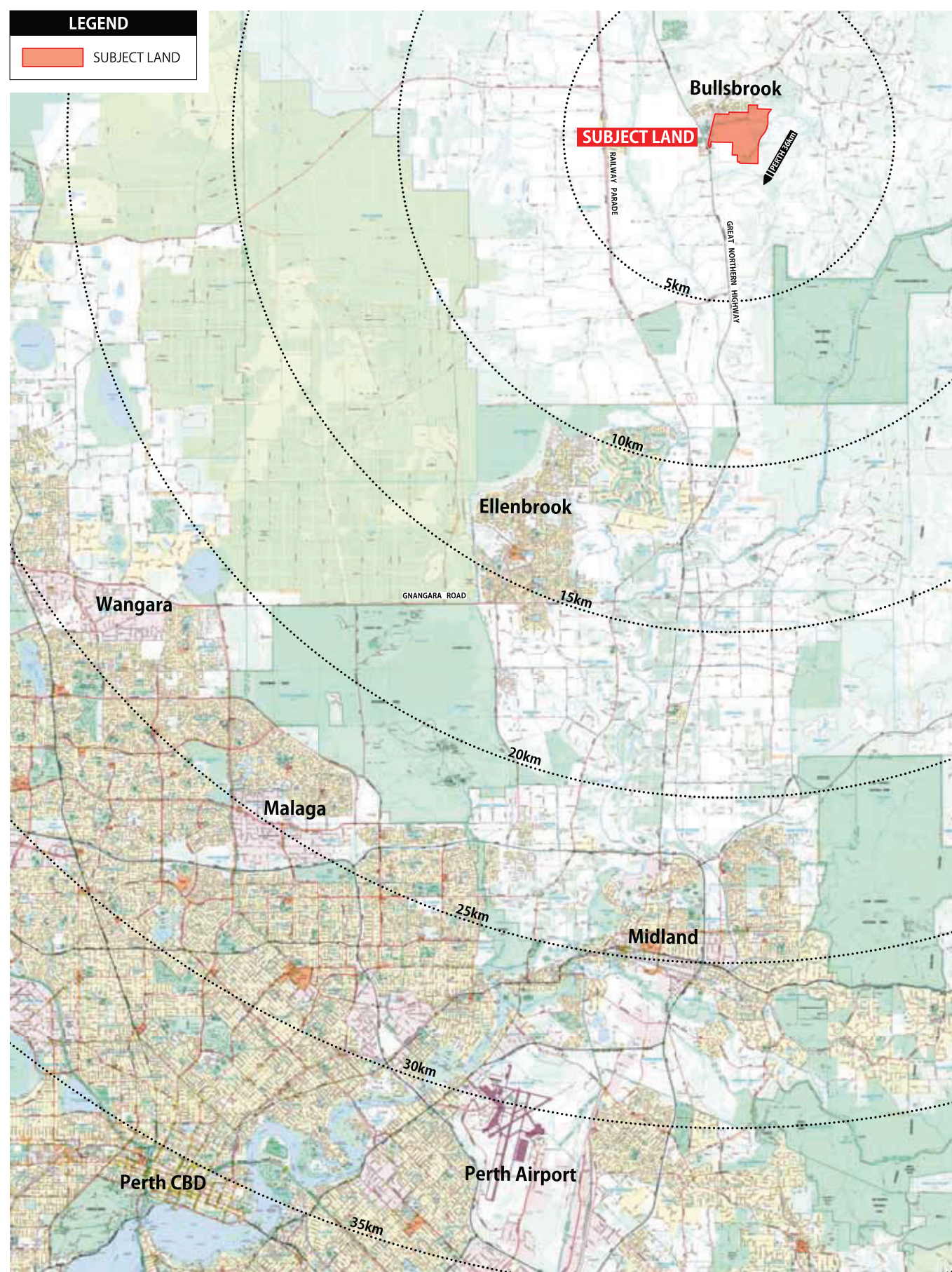
- Lots 1-6 Great Northern Highway
- Lots 2, 7, 8, 9, 10, 900, 9007, 1396, 1314 Chittering Road
- Pt Lot 1343 and Lots 834, 433 Hurd Road.
- Pt Lot 2792 Taylor Road

1.4 Project Team

The following multi-disciplinary project team have been engaged to progress the preparation of the Structure Plan:

Discipline	Consultant
Acoustic	Herring Storer
Traffic and Transport	Transcore
Servicing and Infrastructure	JDSi
Surveyors	McMullen Nolan Group (MNG)
Landscape	Emerge Associates
Environmental	RPS
Aboriginal Heritage	Ethnoscience
Retail Assessment	Taktiks4
Bushfire	Strategen JBS&G
Hydrology	RPS
Planning + Urban Design	Hatch RobertsDay

FIGURE 1: Location Plan



2.0 Planning Framework

2.1 Zoning and Reservations

2.1.1 Metropolitan Region Scheme

The current Metropolitan Region Scheme (MRS) zoning and reservations are shown in Figure 2.

Kingsford Estate covers a total 254.6ha area, of which is zoned 'Urban' under the MRS. The Structure Plan area only encompasses land which is zoned 'Urban' under the MRS. The balance of the Kingsford Estate, is zoned a mix of 'Rural' zone (8.8ha) and Primary Regional Road reservation (1.21ha).

An application to amend the MRS to rezone the balance of Kingsford Estate from 'Rural' zone has been lodged and is currently with WAPC. Once the land is zoned 'Urban' under the MRS, an amendment/addendum to the Structure Plan will be required prior to subdivision and development of the land.

The land reserved as 'Primary Regional Roads' under the MRS will facilitate future widening required for Great Northern Highway, which abuts the south-western boundary of the Structure Plan area.

2.1.2 City of Swan Local Planning Scheme No. 17

The current Local Planning Scheme No. 17 (LPS 17) zoning and reservations are shown in Figure 3.

The Structure Plan area is zoned "Residential Development".

An MRS Amendment (1324/41) affecting the southern portion of the Structure Plan was gazetted on 10 December 2019, transferring the land from 'Rural' to 'Urban' zone. To reflect this change, Scheme Amendment No. 186 to LPS17 rezoned the land from "General Rural" to "Residential Development". This Scheme Amendment will ensure all land contained within the Structure Plan area is zoned "Residential Development" under LPS17.

The WA Planning Commission at their meeting on the 25 August 2021 resolved to:

1. transfer portions of Lots 1314, 1396 & 9003 Chittering Road, Lot 433 and portions of Lots 834 & 1343 Hurd Road, and a portion of Lot 2792 Taylor Road, Bul/sbrook as shown on Plan No. 4.1661 from the Urban Deferred zone to the Urban zone pursuant to Clause 27 of the Metropolitan Region Scheme; and
2. amend the City of Swan Local Planning Scheme No. 17, by transferring the Urban zoned land from the General Rural and Landscape zones to the Residential Development zone pursuant to section 126(3) of the Planning and Development Act 2005.

Under LPS17 the objectives 'Residential Development' zone include:

- c. Provide for the coordinated development of future residential areas through the application of a comprehensive plan to guide subdivision and development to be known as a "Structure Plan";
- d. Provide for predominantly residential development, but including also a range of compatible services, consistent with the needs of an integrated neighbourhood, and planned so as to minimise adverse impacts on amenity;
- e. Avoid the development of land for any purposes or at a time when it is likely to compromise development elsewhere in the district or prejudice the future development of land in the Residential Development zone for more appropriate purposes;
- f. Take account of the need to protect the amenity and on-going use of adjacent property owners as well as to provide for the needs of future residents.

This Structure Plan has been prepared in accordance with Part 4 of the Planning and Development (Local Planning Schemes) Regulations 2015 Schedule 2 – Deemed Provisions and Clause 5A.1 of LPS17 which requires a Structure Plan to be prepared for land zoned 'Residential Development' before any subdivision or development of the land is to be undertaken.

The balance of Kingsford Estate is zoned 'General Rural' and 'Landscape' under LPS17. This land is required to be zoned 'Urban' under the MRS and 'Residential Development' under LPS17 prior to inclusion within the Structure Plan area via a Structure Plan amendment/addendum.

FIGURE 2: Metropolitan Region Scheme

LEGEND

Reserved lands

- Parks and recreation
- Public purposes

Reserved roads

- Primary regional roads

Zones

- Industrial
- Rural
- Urban
- Urban Deferred

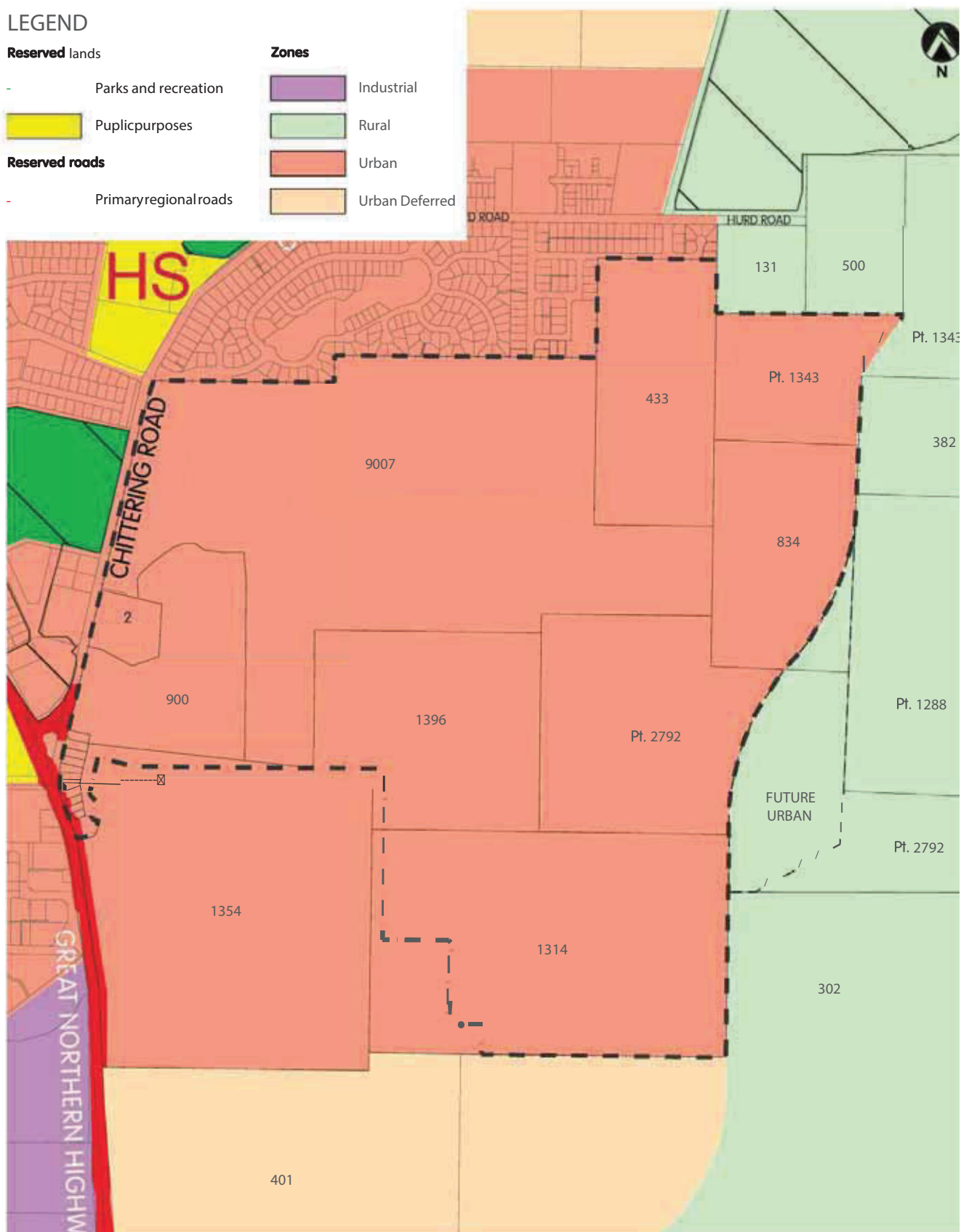
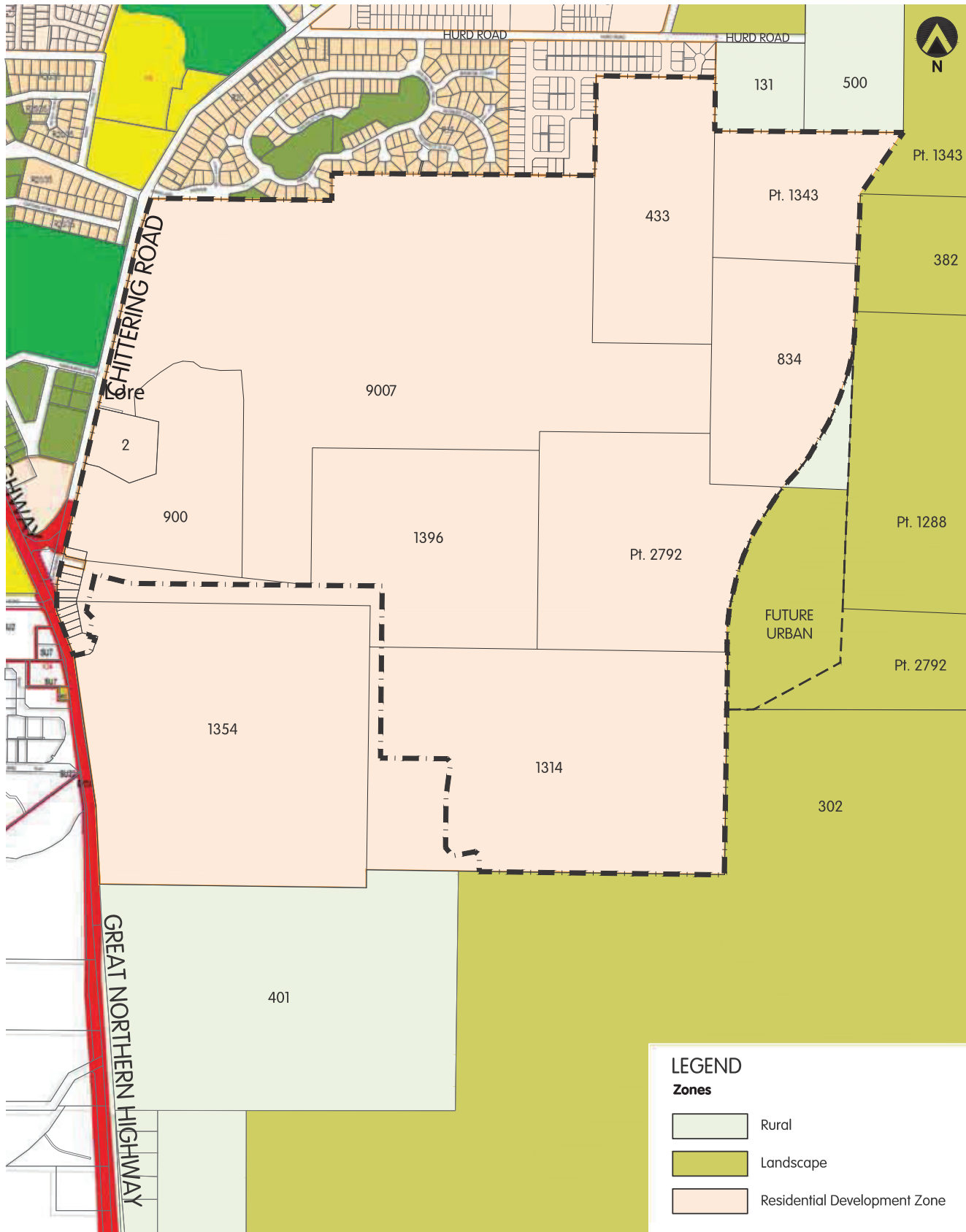


FIGURE 3: Local Planning Scheme No. 17



2.2 Strategic Planning Framework

2.2.1 Perth and Peel @ 3.5 million

Perth and Peel @ 3.5 million is the highest-level strategic planning document which establishes a vision for the future expansion of Perth Metropolitan and Peel Regions, which is project to grow to a population of 3.5 million, with a total 800,000 new dwellings to be provided by 2050. To achieve this expected growth without on our way of life, natural environment and physical infrastructure, the State sets housing targets for each sub-region. Of the new dwellings, 47% (380,000) dwellings are to be accommodated within existing infill areas, whilst the remaining 53% (420,000 dwellings) will be built in outer sub-regions. This 'Connected City' model ensures a wide range of choices to future home buyers across Perth and Peel. The suitability of development in the outer sub-regions is based on proximity to employment and services, protection of major environmental assets and capacity for efficient provisions of infrastructure and essential services.

The Structure Plan area is located within the North-East Sub-Region, which has a housing target of 102,560 to be provided by 2050. It is expected that this population growth will predominantly be focused within the City of Swan, which will contribute 73,450 additional dwellings (of which 25,690 infill) and approximately 60% of the sub-region's population by 2050.

The Structure Plan area is identified as 'Urban Zoned – Undeveloped' as land which is a State priority for increased density, being vacant, under-utilised urban land that can be serviced by the required infrastructure and located in proximity to activity centres, transit corridors and areas of high amenity (refer Figure X). The Sub-Regional Framework identifies 'Urban Zoned – Undeveloped' areas will contribute 57,440 new dwellings towards the housing target, and 'Urban Expansion' 35,330 new dwellings by 2050.

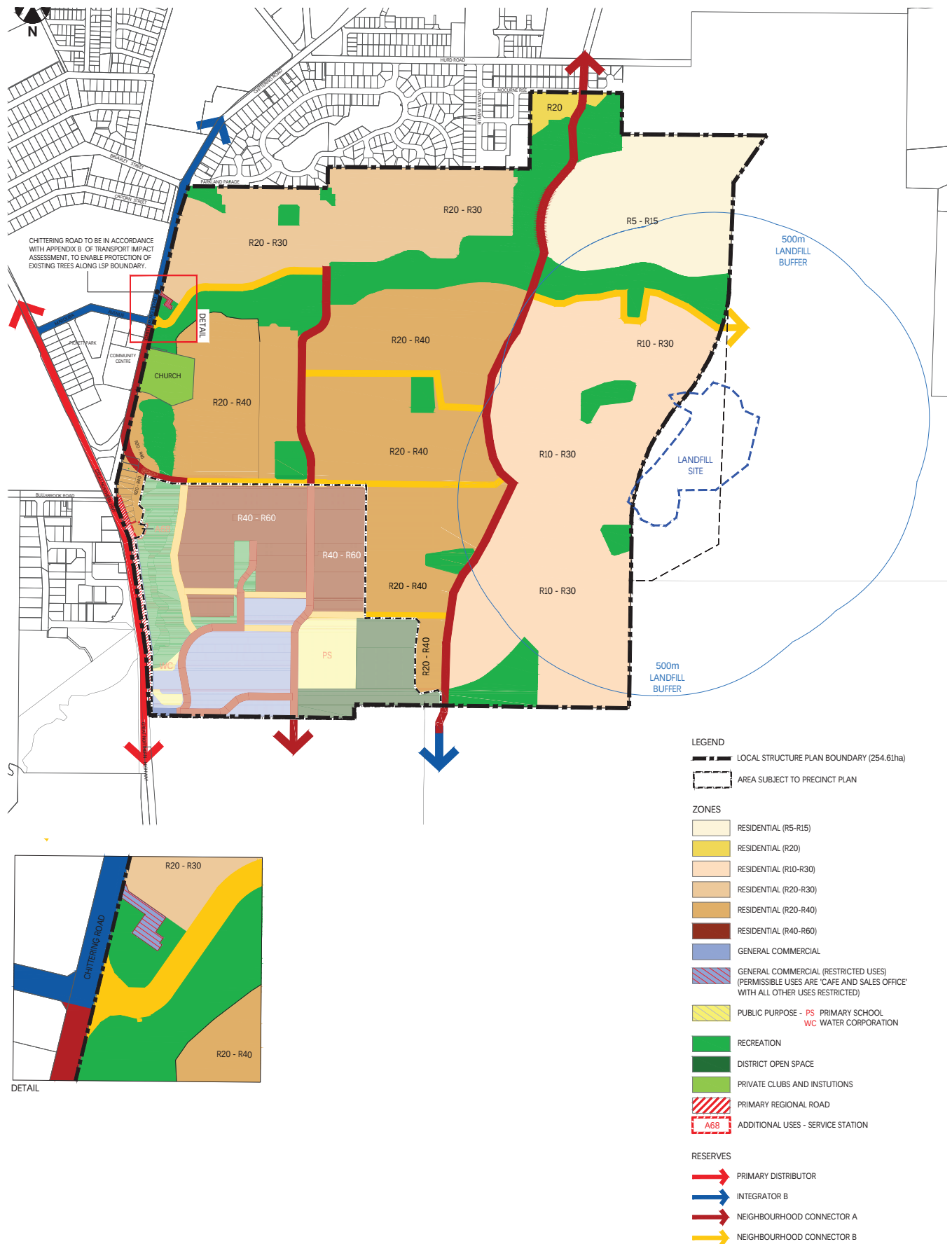
The Sub-Regional Framework also includes anticipated timeframes for the delivery of urban development sites, with the Structure Plan area identified as 'short term' to be developed by 2015-2031, with the balance of the Kingsford Estate identified as 'medium-long term' to be developed after 2022.

The planned residential growth within Bullsbrook will be supported by the Kingsford Town Centre which is identified within the Sub-Regional Framework as a "District Centre" within the activity centres hierarchy.

More broadly, the Structure Plan will be supported by the Bullsbrook South industrial area which is identified for future industry and commercial expansion to achieve an economic trade cluster focused on existing and proposed freight transport infrastructure. The Bullsbrook RAAF base will also continue to operate as a key military air training facility and flight training base.

An intermodal freight terminal is identified south-east from Bullsbrook, accessible to Stock Road, to connect Perth-Geraldton. The terminal will have an important role in the freight network having rail connections to Fremantle Port and proposed Kwinana Outer Harbour, as well as to the regions in the north of the State. It is anticipated this facility will not be required prior to 2031.

FIGURE 4: Local Structure Plan



2.2.2 City of Swan draft Local Planning Strategy

The Local Planning Strategy provides the local context to interpret State and regional policies for the City of Swan. It provides the planning rationale for zones, reservations and development controls contained in the City of Swan's Local Planning Scheme No. 17 (LPS17). The Strategy will be the principal land-use document used to assist the City in decisions making over the next 10-15 years.

The Strategy outlines the intended development outcome over a 10-15 year period, to achieve the State's housing target of 73,450 additional dwellings (of which 25,690 infill) and further 176,100 new residents.

The City will have regard to the strategies and actions which focus on the following themes/objectives:

1. Natural Resource Management and Environmental Protection – protect the City's natural resources, provide responsible environmental management and manage impacts of climate change;
2. Population and Housing – facilitate a wide range of housing and lifestyle choices for current and future residents;
3. Economy and Employment – Facilitate the creation of a sustainable economy and provide opportunities for growth in a wide range of employment areas;
4. Retail and Activity Centres – Develop a viable and sustainable network of activity centres to provide for the community's social and economic needs;
5. Tourism – to stimulate the tourism industry and showcase the Swan Valley and the City's main attractors;
6. Open Space and Community Facilities – Provide a diverse range of functional and quality open space and community facilities that can be managed in a sustainable way to meet the long terms needs of the community;
7. Rural Land Uses, Subdivision and Development - encourage sustainable development and land uses in rural areas whilst recognising the importance of protecting agricultural, natural and basic raw material resources;
8. Urban Design and Heritage – enhance the built form throughout the City to create interesting and attractive places and protect the City's heritage;
9. Transport, Traffic and Access - provide an integrated transport system that provides residents, workers and visitors with high quality, safe and efficient transport mode choices to meet the personal, employment and freight transport needs of the City into the future; and
10. Infrastructure Services - achieve a whole of government approach in the provision of and improvements to essential infrastructure (water, wastewater and power).

Bullsbrook is identified as a 'growth area' to accommodate the State's housing targets. A District level centre is also identified in Bullsbrook to cater for the future population growth.

The strategies and actions of the draft Local Planning Strategy will guide decision making with respect to future amendments to the MRS and LSP17, the adoption of Structure Plans and assessment of development proposals.

2.2.3 City of Swan Urban Housing Strategy

The Urban Housing Strategy reviews the City's current housing stock and identifies areas that are suitable for higher residential densities. It aims to ensure long term sustainable future residential development through the creation of an accessible, well connected and sustainable community where all demographics has access to varied housing. The Urban Housing Strategy is described as an informing document, and the draft Local Planning Strategy is the main document to guide consideration of development.

The principal objectives of the Urban Housing Strategy are to:

- Encourage the provision of a range of housing options through urban areas of the City to meet the changing needs of residents. This includes the provision of housing for Aged/Dependent persons and people with special needs.
- Facilitate the creation of walkable communities adjacent to activity centres and transport nodes that will reduce the demand for car based travel, encourage the use of alternative transport modes and provide opportunities for increased social interaction.
- Provide a strategy framework for increasing residential densities within existing established areas in selected locations. These location are to be identified in accordance with the principles of Liveable Neighbourhoods, Transit Oriented Development and heritage protection.
- Identify suitable mechanisms for controlling the built form outcomes in identified infill areas to protect existing residential amenity.

The Structure Plan will meet the objectives of the strategy through the provision of a range of housing densities and styles which will facilitate an accessible, amenable and walkable community. This will assist the City of Swan to fulfil its housing targets as its population grows.

The Urban Housing Strategy comprises an Infill Strategy and a Greenfields Strategy which respond to Perth and Peel @ 3.5 million and the City's draft Local Planning Strategy to achieve 73,450 additional dwellings by 2050. The Greenfields Strategy applies to greenfield areas which are subject to current and future structure planning. The Greenfields Strategy identifies the Structure Plan area as a mix of 'Urban Deferred Zoned Undeveloped' and 'Urban Expansion Area 2011 – 2015'.

2.2.4 City of Swan Bullsbrook Approved - Townsite District Structure Plan

The Bullsbrook Townsite District Structure Plan (DSP), provides a strategy for the future development of Bullsbrook Townsite and has been used as a base to guide the design of the Structure Plan and allocation of land uses.

The objectives of the DSP include:

- Allow for a diversity of land use, which:
 - Provides for metropolitan and local residential land needs for the growing population;
 - Create a vibrant activity centre with increased local employment and business opportunities, as well as improved services;
 - Assists in addressing the State's land shortage;
 - Generates local employment opportunities to contribute to self-sufficiency; and results in essential industrial growth within the existing 'Industrial' zone with an appropriate land use and built form interface along Great Northern Highway;
- Protect the natural environment;
- Provide the necessary basic infrastructure (including public open space and community facilities) to support urban development;
- Protect existing and identified long-term land uses, including the Pearce RAAF Base and resources; and
- Protect existing prime agricultural and horticultural land where applicable.

The DSP identifies the Structure Plan area to be developed for urban purposes, comprising largely of 'Future Residential'. A 'District Centre' co-located with a 'Primary School', 'Rapid Transit Terminus' and 'District Open Space' is to be provided to the south of the Structure Plan. An 'Activity Corridor' connects the existing Bullsbrook Townsite north of Chittering Road through the Structure Plan area to the 'District Centre'. This road will connect south, outside of the Structure Plan, to a smaller 'Neighbourhood Centre' at the intersection of Lage Road and Great Northern Highway. Ki-It Monger Brook is identified as 'Conservation' dissected by two north-south roads which provide key transport connections.

The DSP identifies a 'High School' nominated outside of Kingsford Estate, to the east. Based on pre-lodgement consultation with the Department of Education (DoE), it is our understanding the preferred approach is for expansion of the existing Bullsbrook College to be pursued in the first instance, with the site nominated in the DSP as a potential location in the event expansion of the existing Bullsbrook College cannot be facilitated.

The land use designations in the DSP have been generally reflected within the Structure Plan.

2.3 Planning Policies

The following State Government policies are considered relevant and applicable to the Structure Plan area:

- SPP 2.8 Bushland Policy for the Perth Metropolitan Region
- SPP 3.7 Planning in Bushfire Prone Areas
- SPP 5.4 Road and Road Noise
- SPP 7.0 Design of the Built Environment
- SPP 7.3 Residential Design Codes Volume 1
- Liveable Neighbourhoods

A number of Local Planning Policies and strategies have been taken into account of part of the Structure design, these include but are not limited to:

- Biodiversity Strategy
- Sustainable Environment Strategy
- Transport Strategy
- POL-E13.11 Inclusion of Pedestrian Accessways in Residential Subdivisions
- POL-C-104 Environmental Planning Policy
- POL-LP-11 Variation to deemed-to-comply requirements of the R-Codes Medium
- Density Single House Development Standards (R-MD Codes)

2.3.1 Liveable Neighbourhoods

Liveable Neighbourhoods (LN) is an operational policy used to guide the design and assessment of structure plans and subdivision applications in greenfield areas and larger infill sites.

The key initiatives of LN are covered under eight design elements: community design, movement network, lot layout, public parkland, urban water management, utilities, activity centres and employment and schools.

Objectives of particular relevance to this Structure Plan include:

- To ensure a site-responsive approach to urban development that supports and enhances the context in which it is located, strengthens local character and identity, integrates with its context and promotes a sense of community;
- To provide a safe, convenient and legible movement network, and to provide attractive streetscapes;
- To ensure that urban development lots have a suitable level of amenity, services and access;
- To provide a network of well-distributed parks and recreation areas that offer a variety of safe, appropriate and attractive public open spaces; and
- To integrate appropriate water management measures in an efficient urban structure and range of parkland types.

By providing for a diverse range of housing within a connected and walkable neighbourhood, structured around high-quality POS, the Structure Plan reflects the key aims of LN.

LN is a performance-based code where the requirements of LN may be satisfied in a number of ways. LN aims to balance the maintenance of acceptable standards and meeting strategic vision, with encouraging greater innovation in response to market needs.

2.3.2 State Planning Policy 7.3 – Residential Design Codes (Volume 1)

State Planning Policy 7.3 Residential Design Codes Volume 1 (R-Codes) provides a comprehensive basis for the control of residential development throughout the State. The key objectives of the policy are:

To encourage design which is responsive to the site, size and geometry of the development site;

- a. To allow variety and diversity as appropriate where it can be demonstrated this better reflects context or scheme objectives;
- b. To ensure clear scope of scheme objectives to influence the assessment of proposals; and
- c. To ensure certainty in timely assessment and determination of proposals applied consistently across the State and local governments.
- d. The R-Codes is a performance based document, where an application can either be assessed to satisfy the 'deemed-to-comply' provisions or by addressing the 'design principles' under the exercise of judgment by the City of Swan.

A Local Planning Policy (LPP) or Local Development Plan (LDP) may vary the provisions of the R-Codes where consistent with the 'element objectives' and 'design principles'.

2.3.3 State Planning Policy 5.4 – Road and Rail Noise

The purpose of this policy is to minimise the adverse impact of road and rail noise on noise sensitive land use and development within specified trigger distances of strategic freight and major traffic routes.

Great Northern Highway, which borders the south-western boundary of the Structure Plan is identified under the MRS as Primary Regional Road (red road), with a projected daily traffic count of 17,000 - 18,000. These roads have a "trigger distance" of 200m as measured from the road carriageway edge. The policy requires development within this trigger distance to require the preparation of a noise management plan to determine the actual noise levels and demonstrate the proposal can mitigate the impacts of noise through attenuation measures.

A Road Traffic Noise Impact Assessment has been prepared, in accordance with SPP 5.4 to support the design of the Structure Plan (refer Appendix I).

2.3.4 State Planning Policy 2.4 – Basic Raw Materials

This policy sets out the matters to be considered for development in the vicinity of identified Basic Raw Material Resource (BRM) areas. BRM are described as sand (including silica sand), clay, hard rock, limestone (including metallurgical limestone) and gravel and other construction and road building materials, which are generally important to land development. This policy seeks to ensure BRM can be extracted close to the market in the metropolitan region and sensitive development that could conflict with extraction.

The policy is applicable as the Structure Plan boundary incorporates the former Clay Quarry located within Kingsford Estate to the east. The operations ceased operation in December 2020.

2.3.5 City of Swan - Local Planning Policy (POL-LP-11)

Local Planning Policy POL-LP-11 Variation to Deemed to Comply Requirements of the R-Codes – Medium Density Single House Development Standards (R-MD Codes)

The City of Swan Local Planning Policy POL-LP-11 Variation to Deemed to Comply Requirements of the R-Codes – Medium Density Single House Development Standards (R-MD Codes) adopts the Medium-density single house development standards (R-MD Codes) via the WAPC Planning Bulletin 112/2016. The R-MD Codes reflects contemporary housing typologies and incorporates existing R-Code variations that have been applied to date.

The R-MD Codes replace the deemed-to-comply requirements of the following clauses of the R-Codes:

- Building and Garage setbacks;
- Open Space;
- Parking;
- Visual Privacy; and
- Solar Access.

All other relevant R-Code standards continue to apply. Where there is a conflict between the provisions of the R-MD Codes and an approved LDP, the LDP provisions prevail to the extent of any inconsistency.

2.3.6 Government Sewerage Policy

This policy establishes the State's position on the provision of sewerage through planning and development of land. The policy requires all subdivision and development to be connected to reticulated sewerage, unless it is exempted from this requirement under the Policy.

To address the requirements of the Policy a Local Water Management Strategy has been prepared (refer Appendix 3) in accordance with Better Urban Water Management including details relating to sewage disposal.

An Urban Water Management Plan will be required at the time of subdivision approval.

FIGURE 5: North East Sub-Regional Planning Framework

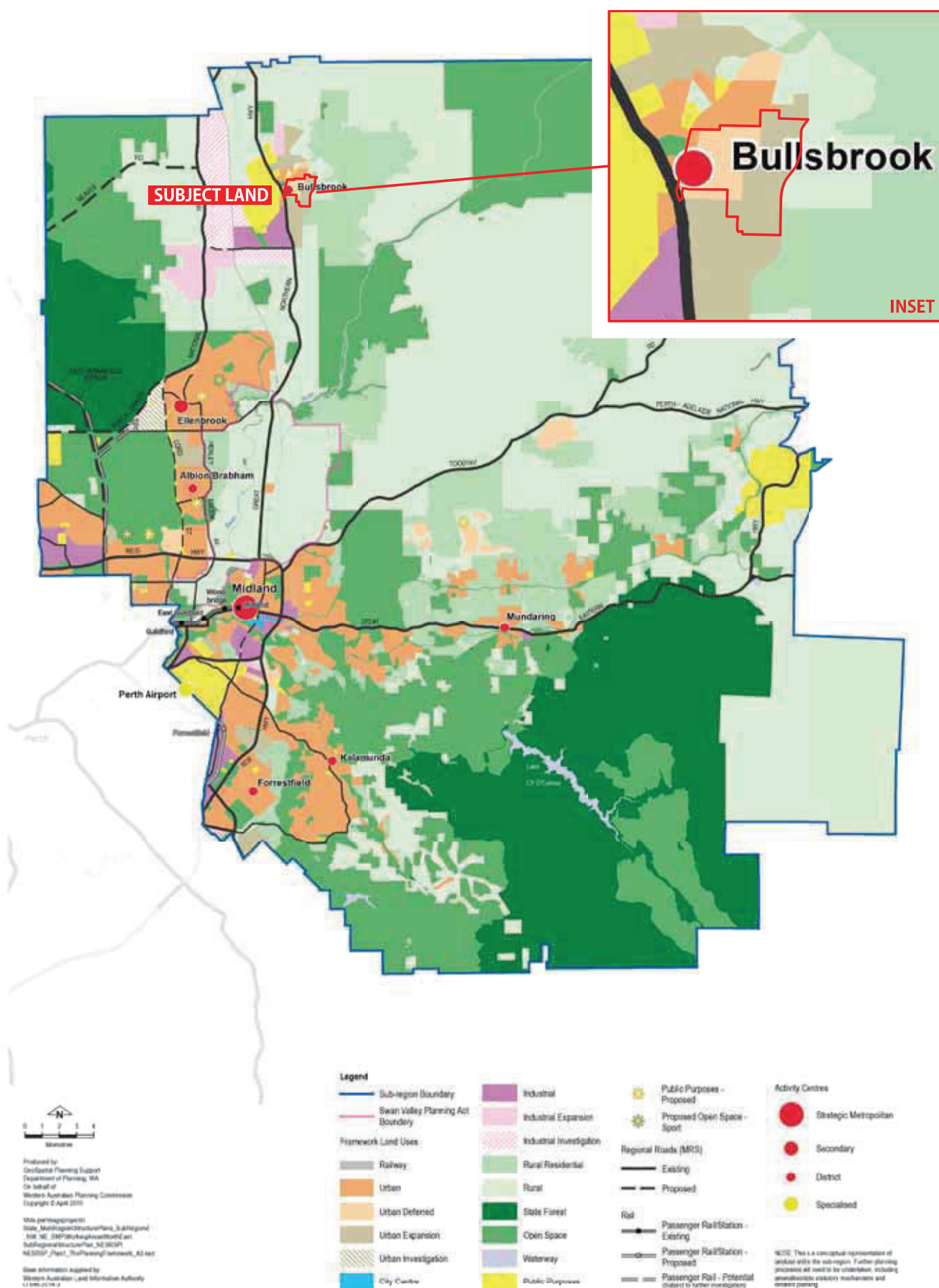
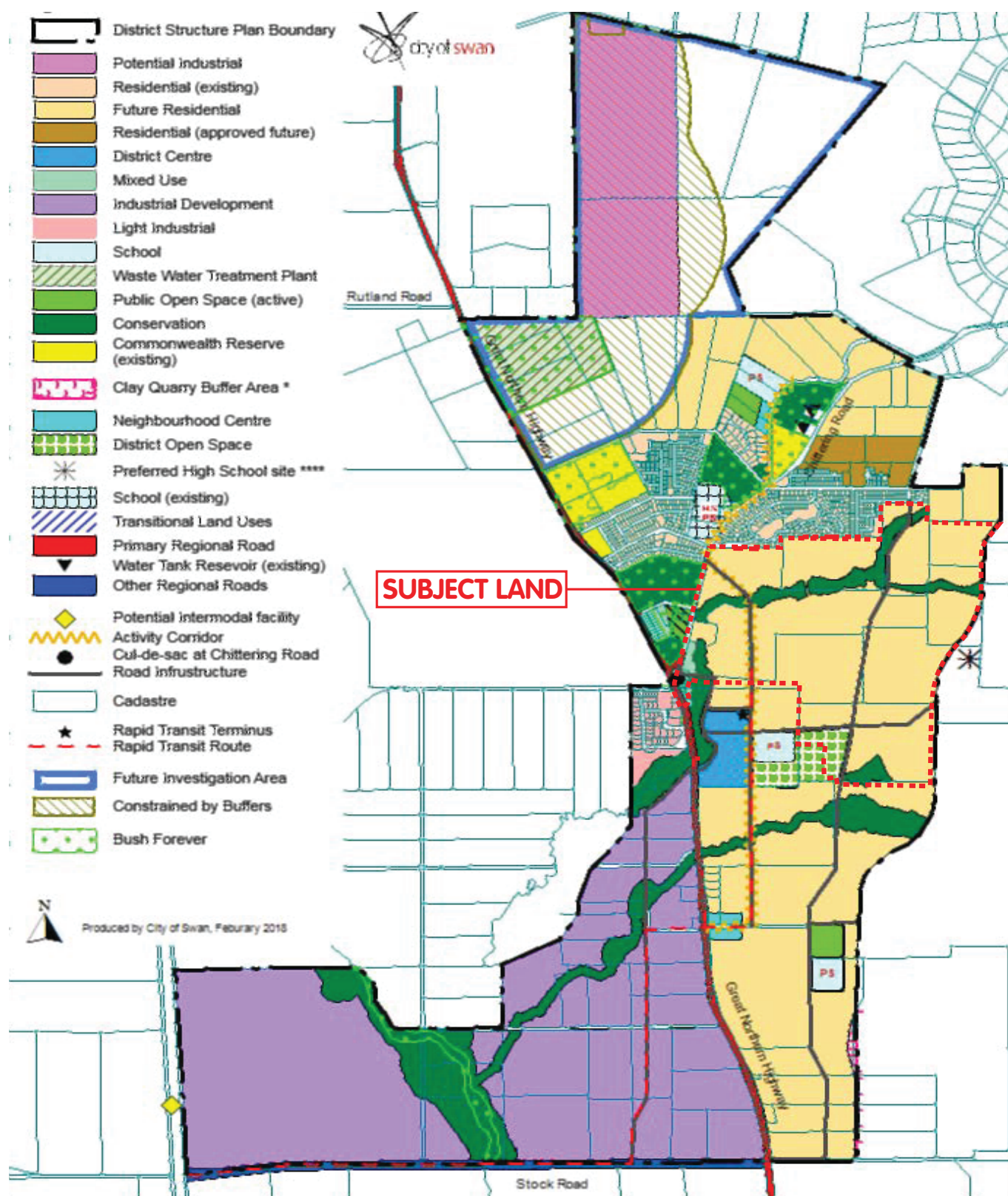


FIGURE 6: Bullsbrook District Structure Plan



3.0 Existing Site Conditions And Constraints

3.1 Biodiversity and Natural Area Assets

An Environmental Summary Report Strategy has been prepared by RPS (refer Appendix 4). To review the existing environmental factors that may be impacted as a result of the development and outline management measures to mitigate any potentially significant environmental impacts.

Historically, the site has been extensively cleared for agricultural purposes and consists largely of turfed paddocks used for cattle grazing, therefore has limited environmental values. Pockets of remnant vegetation are clustered along Ki-It Monger Brook, which traverses east-west through the site. A portion of Ki-It Monger Brook is classified as a Conservation Category Wetland (CCW).

Based on the key environmental outcomes RPS Group recommends the preparation and implementation of the following management plans:

- Preparation and implementation of a Ki-It Monger Brook Foreshore Management Area Report to ensure appropriate management of the Ki-It Monger Brook foreshore;
- Management of the portion of Conservation Category Wetland within the Ki-It Monger Brook through preparation of a Wetland Management Plan.
- Implementation of best practice water sensitive urban design and stormwater drainage management through Urban Water Management Plan(s);
- Planting trees as part of the landscaping works to improve and increase the amount of diverse vegetation;
- Preparation and implementation of an 'End of Life Management Plan' for the Class I Inert Landfill to ensure the landfill site is suitable for the land uses proposed.
- Management of Acid Sulfate Soils; and
- Implementation of management measures to reduce potential noise and fire impacts on future residences.

3.1.1 Vegetation

At a regional level, the remnant vegetation is primarily mapped as being the Guildford Complex, with small areas of Darling Scarp Complex and the Forrestfield Complex. The Guildford Complex has approximately less than 10% of the original (pre-European) extent remaining. The Guildford Complex is associated with Ki-It Monger Brook. The remnant trees within the Ki-It Monger Brook will be retained through the establishment of foreshore buffer areas, development setbacks, drainage retention and open space areas.

The remnant Guildford Complex is also located on the southern boundary of the Structure Plan area (Lot 1314), proposed within Public Open Space to be managed through the subdivision and development process.

A level 2 flora and vegetation assessment of the Structure Plan Area and surrounds was conducted by Ecologia (refer Appendix 1 of Appendix 4). This survey confirms there are no Threatened Ecological Communities (TECs) identified within the Structure Plan area.

The Structure Plan area has been used primarily for agricultural purposes and the majority of the land has been classified as Completely Degraded (Ecologia 2016). Stands of remnant vegetation associated with the Ki-It Monger Brook have been classified as 'Degraded'. Five vegetation units were found to occur within the Structure Plan area. The five vegetation units were associated with the agricultural land use and were rated as either "Completely Degraded" or "Degraded". The only vegetation units identified as being in "Excellent Condition" are located outside of Structure Plan area and are not currently identified for future urban development.

A Remnant Vegetation Management Plan will be prepared to identify and manage vegetation suitable for retention vegetation, outside of the Ki-It Monger Brook.

3.1.2 Flora

A total of 102 vascular plant taxa were recorded within the Structure Plan area and surrounds. Of these, 43.1% are native and 56.9% are introduced species.

No Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999 listed or Wildlife Conservation Act 1950 listed Threatened Flora, Priority flora or other flora species of significance were recorded in the Structure Plan area.

A literature review identified one Threatened flora taxon, *Acacia anomala* that has previously been recorded in Bush Forever No. 86 site located to the north-east of the Structure Plan Area. Based on historical land use, vegetation units mapped and condition, this species is considered likely to occur within the Bush Forever No.86 area but not within the Structure Plan area.

3.1.3 Bush Forever

The Structure Plan area is in close proximity on its northern site boundary (within Lot 857) to Bush Forever Site No. 86. The Bush Forever site is some 43ha of bushland associated with regionally significant vegetation and fauna habitat, including black cockatoo foraging and roosting habitat.

The vegetation within Bush Forever Site No. 86 includes *Eucalyptus accedens*, *E. wandoo* woodlands, *E. wandoo*, *C. calophylla* and *E. marginata* Open Forest to woodland with *Allocasuarina humilis* and *Calytrix angulata* (Government of Western Australia, 2000).

3.1.4 Fauna

The Structure Plan area exhibits a high level of disturbance from historic clearing of native vegetation and mostly comprises cleared agricultural paddocks. Consequently, it is highly unlikely that these areas provide suitable habitat for significant fauna species.

Potential habitat areas would include intermittent remnant native vegetation along the Ki-It Monger Brook. The creek line also allows for the movement of native fauna from the western portion of the site to areas of larger remnant vegetation to the east.

Consequently, through retention of vegetation within Ki-it Monger Brook the limited existing habitat within the Structure Plan area will be retained. Additionally, preservation of the adjacent Bush Forever site No. 86 north- east of the Structure Plan area will assist with retaining fauna habitat.

Based on the fauna habitats remaining within the Structure Plan area, the key species that could potentially be impacted through development of the site are listed below:

- Scattered stands, or individual *Eucalyptus rudis* trees within the creek lines:
- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*)
- Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*)
- Baudin's Black Cockatoo (*Calyptorhynchus baudinii*).
- The banks of the seasonal creek line may support the following migratory bird species:
- Rainbow Bee-eater (*Merops ornatus*) – migratory

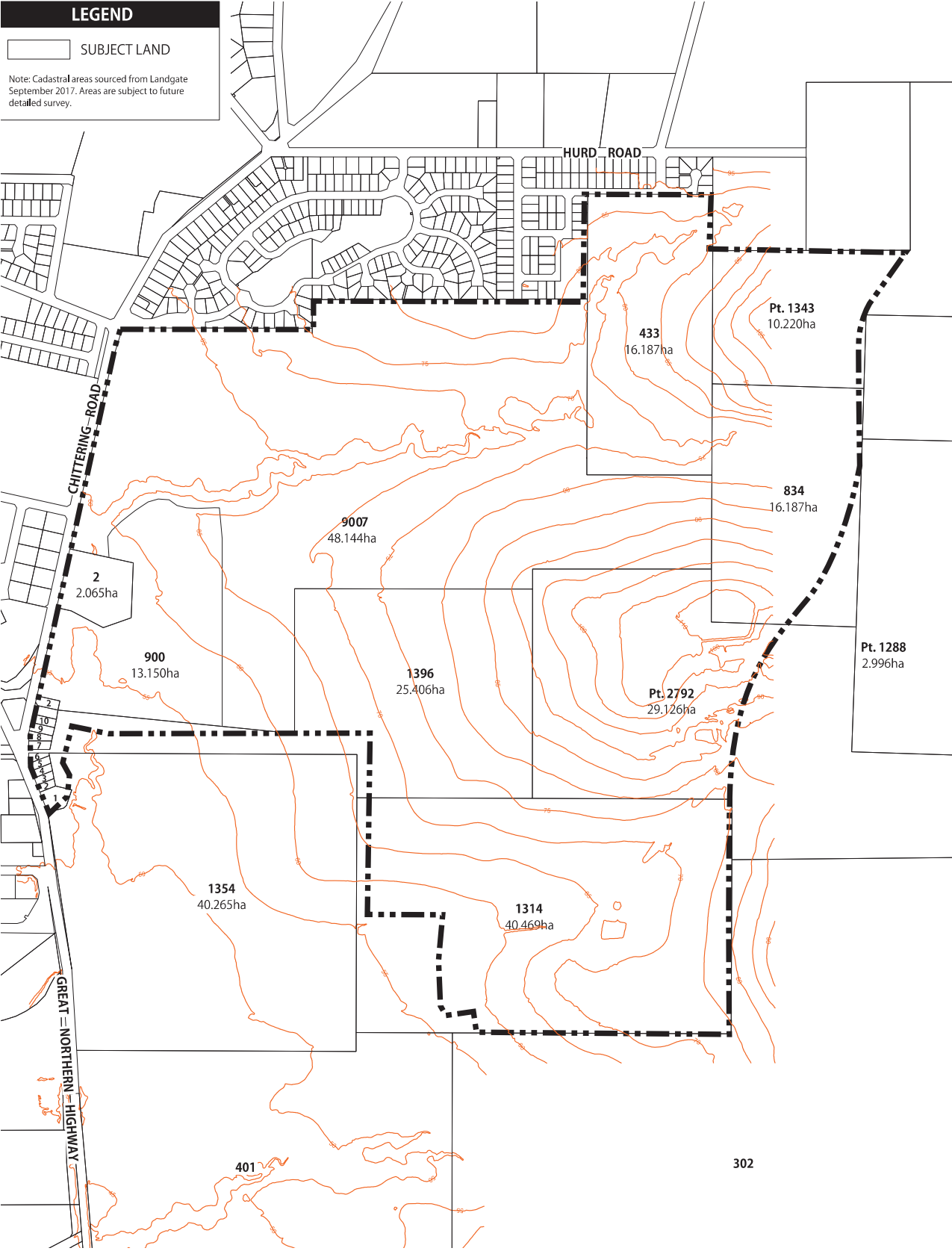
The proposed management and use of the Ki-it Monger Brook and water features on the site (dams) will replicate the pre-development conditions associated with both surface and groundwater availability to the existing vegetation. Therefore avifauna, in particular rainbow bee-eaters, can continue to utilise the creek area and the surrounding buffer after seasonal rain events.

Potential habitat within the Structure Plan area for black cockatoo species comprises poor foraging quality *Eucalyptus rudis* trees within the creek line and the occasional marri tree. These trees will be preserved in the Ki-it Monger Brook and the location of the road creek crossings will be selected to minimise the impacts to the existing mature trees.

Fauna habitat outside of the Structure Plan area (Bush Forever Site No.86) comprises more intact vegetation structure and potentially provides fauna habitat for the Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*) and Baudin's Black Cockatoo (*Calyptorhynchus baudinii*).

The Structure Plan responds to the objectives outlined in EPA Bulletin No. 20 Protection of natural areas through planning and development (EPA 2013).

FIGURE 7: Topography



3.2 Landform and Soils

The landform of the Structure Plan and its surrounds is unique and consists of a series of valleys and hill-tops. Located at the foothills of the Darling Scarp, this creates a topographical range from approximately 120 metres Australian Height Datum (m AHD) in the east, where the foothills begin down to approximately 50m AHD to the south-west, where the relatively flat landscape of the Swan Coastal Plain commences (refer Figure 7). A substantial proportion of the site could be categorised as having moderate to steep slope of 5% or more. Whilst only a portion of the site is excess of 10%, development on steeper land will need to be sensitively design and delivered. On steeper land generally, a combination of civil, landscape and built form solutions will need to address character and functional considerations.

The majority of the Structure Plan area is composed of Silty Sands that are described as strong brown, firm, friable and dispersive in parts. The eastern section of the site includes Siltstone whilst the south-western boundary is dominated by Pebbly silt associated with the Guildford Formation. Two small sections of the Structure Plan area on the eastern boundary has been mapped as granite.

The Department of Environment and Regulation (DER) has compiled broad-scale mapping of the risk of acid sulphate soils for regions of Western Australia. The Structure Plan area has not been assigned an Acid Sulfate Soils (ASS) risk rating and it is assumed there is a “low to no” known risk of ASS occurring within 3m of the natural soil surface (or deeper).

A search of the DER's Contaminated Sites database indicates that no registered contaminated sites were recorded within the Structure Plan area or lands immediately surrounding the site.

3.3 Groundwater and Surface Water

3.3.1 Groundwater

The Structure Plan area is located within the Bandy Spring Sub-area of the Swan Groundwater Area and is managed under the Gnangara Groundwater Areas Allocation Plan. The Bandy Spring Sub-area contains the Superficial Aquifer and Fractured Rock West Aquifer. A review of allocation limits identified that the Superficial Aquifer was fully allocated. The Fractured Rock West Aquifer is not expected to provide significant yields. The confirmed aquifers of the Swan Confined Groundwater sub-area (Leederville and Yarragadee North aquifers) extend beneath the western section of the site, which are also fully allocated. Through consultation with the Department of Water (DoW) and the City of Swan, it was agreed that groundwater could be abstracted from the Superficial Aquifer in the adjacent Cockman Bluff Sub-area and piped across the sub-area boundary to the development site to service its irrigation requirements.

Regional groundwater mapping by the Department of Water indicates groundwater migrates towards Ellen Brook, located approximately 2.3 km to the west. In the Perth Groundwater Atlas the May 2003 groundwater contours just extend onto the western boundary of the Structure Plan area and range from 50 m AHD in the north to 45 m AHD in the south. Groundwater levels monitored from on-site bores ranged from 30.49 m AHD to 77.89 m AHD. Due to the significant depth to groundwater over the majority of the site, a complete 18 month groundwater monitoring program (covering two winter peaks) has not been undertaken. The only two bores with relatively shallow groundwater levels are located near a dam at the landfill facility and the Ki-it Monger Brook respectively and hence it is interpreted the groundwater levels are influenced by localised water conditions.

3.3.2 Surface Water

The key water feature of the Structure Plan area is Ki-It Monger Brook which flows east to west across the northern part of the Structure Plan area. It then runs along the south side of the site, before crossing under Great Northern Highway at the site's south-west corner, until it confluences with Ellen Brook approximately 2.3km south-west of the site. A number of smaller drainage tributaries contribute to the Ki-it Monger Brook including a minor unnamed drainage course that traverses the southern section of the site and discharges into Ki-it Monger Brook near the site's south-west corner.

The Ki-it Monger Brook has been considerably modified including the constriction of dams and installation of culverts on the site which restrict flows as well as the clearing of riparian vegetation. In particular, a major dam located in the centre of the site has a major impact on flows downstream, as flows only occur once the water level reaches the height of the culverts installed in the dam wall.

3.3.3 Wetlands and Waterways

The Structure Plan area includes two wetlands that occur within sections of the Ki-it Monger Brook; one is classified as a Conservation Category Wetland (CCW) (UFI 12681) and one is a Multiple Use Wetland (MUW) which is likely to have few important ecological attributes and functions remaining.

A botanical assessment was conducted detailing the spatial extent and characteristics of the wetlands within the Structure Plan area, in particular the CCW (UFI 12681). There were no significant flora species recorded or likely to occur along Ki-it Monger Brook.

Both the CCW and MUW within Ki-it Monger Brook had vegetation condition rated as 'Degraded' with no or scattered native understorey plants, litter, high grazing levels and dominated by weeds. There were no differences in the vegetation type, floristic composition, condition or values in the CCW section of the Ki-it Monger Brook, the MUW section or the un-classified section (i.e. parts of the Ki-it Monger Brook that were surveyed but are not classified as a CCW or MUW).

Based on the current biophysical condition of Ki-it Monger Brook within the Structure Plan area, it is proposed to retain the foreshore area to the extent of the banks for the majority of the site. The width of the foreshore area will vary along its extent, ranging from approximately 120m at its widest and 10m at the narrowest point, incorporating both sides of the bank.

3.4 Heritage

A search of the Department of Indigenous Affairs (DIA) Aboriginal Heritage Inquiry System (AHIS) database identified one registered Aboriginal site of mythological significance within the Structure Plan area, being the Ki-It Monger Brook 2 (Site ID 3583). The desktop search also identified one 'Other Heritage Place' within the Structure Plan area, being the Bullya Spring (Site ID 22669).

Ethnoscience were engaged to carry out a desktop Aboriginal heritage assessment of the Structure Plan area and surrounds (refer Appendix 6).

A search of the Heritage Council's database resulted in no matches for European Heritage within the Structure Plan area.

3.5 Existing Movement Networks

A Transport Assessment, prepared by Transcore (refer Appendix 5), identified the following characteristics of the existing movement network.

3.5.1 Great Northern Highway

The Structure Plan area is located immediately east of Great Northern Highway, a 'Primary Regional Roads' reservation under the MRS; this providing excellent access to the broader Perth metropolitan region. A portion of Great Northern Highway road widening is anticipated within the Structure Plan area adjacent in accordance with the current MRS reservation (Clause 42 refers).

Great Northern Highway is classified as a 'Primary Distributor' by the MRWA with existing average weekday traffic volumes of ~14,362 vehicles per day to the south of Bullsbrook Road and ~10,503 vehicles per day south of Rutland Road. It is constructed as a two-lane (without median) rural highway adjacent to the Structure Plan area.

The posted speed limit on Great Northern Highway is 60km/h through the Bullsbrook town centre and adjacent to the Structure Plan area, increasing to 80km/h south of Butternab Road and 100km/h south of Lage Road.

All of the intersections along Great Northern Highway in the Bullsbrook area operate under priority control (i.e. Stop or Give Way control).

3.5.2 Chittering Road

The MRWA designates Chittering Road as a 'Regional Distributor' road with existing average weekday traffic volumes of ~6,205 vehicles per day to the east of Great Northern Highway and ~4,705 vehicles per day to the east of Hurd Road. It is a two-lane road, 7.4m wide between kerbs, within the Bullsbrook town centre and reverts to two-lane rural road standard northeast of Hurd Road.

All of the intersections along Chittering Road in the Bullsbrook area operate under priority control (i.e. Stop or Give Way control).

3.5.3 Existing Pedestrian and Cyclist Networks

There are currently no pedestrian or cyclist facilities within the Structure Plan (except for the recently constructed residential areas) area or on the adjacent extent of Great Northern Highway. Footpaths however are provided through the Bullsbrook town centre.

Chittering Road has a 2.0m shared path on one side within the Bullsbrook town centre and on both sides in the vicinity of the existing high school and primary school site.

3.5.4 Existing Public Transport

The closest existing bus route to the Structure Plan area is Bus Route 311 (Midland Station – Bullsbrook).

Route 311 runs on Great Northern Highway adjacent to the Structure Plan area. It provides six bus services each way on weekdays and two on Saturdays, Sunday and public holidays. Existing bus service time are primarily designed for journeys to and from work, school and other trips to and from Midland during business hours such as shopping or personal business trips.

4.0 Design Philosophy

The existing site conditions highlight opportunities and constraints the Structure Plan design must respond, these include:

- Undulating landform presents opportunities to create distinct urban villages;
- The Darling Range provides a dramatic landscape backdrop;
- The heavily vegetated Ki-It Monger Brook is a stunning natural asset and source of amenity, health, history, retreat, fun and discovery with the core creek area to be retained;
- Opportunity to provide ecological corridor linking the site to existing Bullsbrook green network;
- Offer of diverse views resulting from unique valley and hilltops;
- Vehicle access required from Chittering Road and Great Northern Highway;
- The Chittering Road realignment will provide the major north-south connection through the site in the form of an attractive transit boulevard;
- The centrally located existing homestead will be retained and integrated into the master plan design; and
- Steep topographic provides will need to be sensitively designed and delivered.

The Structure Plan design has taken into consideration the environmental and physical attributes within and external to the site, as well as acknowledging abutting land uses and how these can best be addressed with regard to interfacing with future residential land uses.

4.1 Concept Plan

A Concept Plan has been prepared to support the Structure Plan and provide an overview on the future pattern of subdivision and development. The Concept Plan is subject to detailed refinement at the subdivision stage.

The Concept Plan proposes an urban layout utilising an interconnected road network and open space system which embraces the existing landform and amenity, including the Ki-It Monger Brook. The design encourages safe pedestrian movements within the site, and to connect to regional infrastructure to various City of Swan community nodes.

The Concept Plan has been predicated on the following design principles:

A. Immersed in the Landscape

Views play a significant role in defining the sense of place. Spatially there are six areas on the site, each with a defined view shed, sense of enclosure or openness, and elevation, all of which enjoy views back to the scarp backdrop:

- Intimate middle valley featuring an elevated creek link;
- Larger lower valley with creek link and some long views;
- Flats has views to the scarp and creek line tree tops;
- Rise includes view to the scarp and creek line;
- Peak is an elevated long open space and city views; and
- Upper valley is elevated with clear views down to the creek line.



4.1.1 Connected by Nature

Ki-It Monger Brook provides a 4.2km contiguous ecological link which runs centrally through the estate and along the western boundary to provide a natural green setting. Walking and cycling paths set amongst avenues of existing and retained trees will provide the entire community with convenient access to the Brook, Town Centre, Playing fields and Primary School. The southern extent of the Brook is positioned on a meandering topographical low-point culminating in the Kingsford Town Centre where it takes on a more urban character before returning to nature. Within the Brook, the community will be able to engage with nature in various ways, without compromising ecological values.

4.1.2 Transit Village

The Bullsbrook Town site will over time have good access to public transport via a Rapid Transit Service line which is intended to service the Swan Urban Growth Corridor and Ellenbrook. Kingsford Estate will make a significant contribution to this, with an 'Activity Corridor' boulevard extending north-south through the site as a realignment of Chittering Road. For the boulevard to support walking, cycling and residential frontages it will need to be designed based on leading best practice. It is proposed that a bus stop terminus would be located adjacent to the Kingsford Town Centre consistent with the DSP.

4.1.3 Connected Open Space Network

New Bullsbrook will consist of a contiguous network of open spaces, with the primary objective of connecting the community with Brook, topographical points of interest, the Village Centre and the transit boulevard. The Green Loop will be the major open space connection, consisting of a series of local open spaces that punctuate the movement experience around the site. Highly identifiable within the landscape will be the public open space in the south east, formed around a large stand of retained trees on a knoll. The open space located on the central knoll within the Hill-Top Village plays a very important role in the urban structure. It is effectively a pivot point for aligning a series of avenues that provide visually and physical connectivity to other open spaces, including other high points, the existing Bullsbrook community facilities and the Village Centre.

4.1.4 Integrated Village Centre Heart / Town Centre

Being in the privileged position of the only landholding located next to the existing town, New Bullsbrook master planning and placemaking will focus on integration with the existing town to optimise mutual benefits. The Town Centre will become the nexus between Bullsbrook and New Bullsbrook. Fronting the Brook and Great Northern Highway, the centre will have a strong presence within the town and will be highly accessible. The southern connection will provide excellent access to Great Northern Highway generally, while the northern connection will link directly into the existing centre of town. To the north, the Brook and its network of walking and cycling trails will connect directly into the hub of existing community facilities, including Bullsbrook College, the new library, community centre and café.

The Kingsford Town Centre will over time offer the existing and future community district level retail, education, a diversity of public spaces, services, lifestyle, rapid transit, more urban living choices and, above all, a place for the entire community to come together.

A separate 'Precinct Plan' for the Town Centre has been lodged with the City of Swan and WA Planning Commission (July 2021).

4.2 Village of three neighbourhoods

Kingsford Estate will consist of three distinct neighbourhoods: Brook, Heart and Hilltop.

Brook

The lifeblood of New Bullsbrook and focal point of this neighbourhood will be Ki It Monger Brook. The design response to the Brook will be to integrate the two sides of the neighbourhood, and connect the other neighbourhoods and the broader community with the rich Indigenous and European heritage of the site. Defining the edges of this neighbourhood will be existing housing to the north, proposed avenues to the east and south, together with the Brook and Bush Forever to the west.

Heart

This neighbourhood will be the 'Heart' and soul of the New Bullsbrook Village. It will be where the needs and aspirations of the community are most proudly on display. Activity will be at its greatest in this neighbourhood, with its concentration of the Village Centre, transit terminus, urban housing, playing fields, clubhouse and primary school.

Hill-Top

This neighbourhood is distinguished by its desirable elevated location east along 3 hilltops, each with its own public open space focal point. Tree-lined avenues and the Brook define the western edge of the neighbourhood, while the scarp makes for a picturesque eastern boundary.

4.3 Land Use

In accordance with the DSP the Structure Plan will be developed for urban purposes, comprising largely of Residential land uses with a District Centre co-located with a Primary School and District Open Space to be provided within the southern portion of the Structure Plan.

Ki-It Monger Brook will be leveraged as an area of existing amenity. Where possible, areas of POS have been positioned to allow for the retention of existing trees and co-located with natural low points of the site.

An overview of the Structure Plan land uses is provided in Table 1.

TABLE 1: Land Composition

LAND USES	AREA (HA)	PERCENTAGE
Residential	106.28 ha	51.3%
Private Clubs and Institutions (Church)	2.06 ha	1.0%
Recreation (Core Creek)	13.20 ha	6.37%
Recreation (Public Open Space)	24.88 ha	12%
1:1 year drainage	1.90 ha	0.92%
Road Reserves	59 ha	28.41%
Total Kingsford Estate	207.32 ha	100%

4.3.1 District Activity Centre / Town Centre

The “Kingsford Town Centre”, is planned at the southern end of the Structure Plan area to service the Kingsford Estate and wider Bullsbrook population. This centre is identified in the Bullsbrook DSP as a District Activity Centre will significantly contribute to the provision of employment opportunities and self-sufficiency in the area.

In accordance with State Planning Policy 4.2 – Activity Centres, and SPP 7.2 Precinct Design Guidelines a separate Precinct Plan for the Town Centre has been prepared and lodged with the City of Swan. The Structure Plan however has taken the future development of the District Activity Centre into consideration to ensure the future development of this site is not prejudiced by the surrounding land use planning.

4.4 Sensitive Interface

A nursery is located adjacent to the Structure Plan area, south of the proposed District Activity Centre. The generic separation distance from a nursery is 100m (EPA 2015). The generic buffer is primarily based on potential noise impacts.

In regards to interface management, the Town Centre and playing fields are proposed adjacent to the nursery site to manage the long-term interface. The design outcome ensures no sensitive land uses are located within 100m of the nursery.

It should also be noted that the land south of the Structure Plan area (including the nursery) has been identified as future residential land in the DSP.

4.5 Residential

4.5.1 Projected Dwellings

The Structure Plan proposes approximately 2,355 lots dwellings, within a residential density range of R5 to R50, over 106 ha.

Under Perth and Peel @ 3.5 million 'Connected City' scenario new urban areas are to use a minimum average residential target of 15 dwellings per gross hectare of Urban zoned land, and occupancy rate of 2.95 people per dwelling.

The indicative total dwelling yield of 2,355 equates to a total residential estimate of 6947 at 2.95 persons per household (based on Perth and Peel @ 3.5 million average people per household for greenfield locations).

Based on Liveable Neighbourhoods 'Site Hectare' definition, the Structure Plan 'developable area' equate to 106ha to be developed for residential purposes and excludes non-residential land uses including streets, laneways and POS. Based on 2,355 dwellings, the Structure Plan estimates 22 dwellings per site hectare, this complies with LN target of 22 dwellings per site hectare.

The projected dwelling yields across the Structure Plan area are subject to subdivision design and detailed review of drainage and environmental constraints. Preferred lot mix and market demand at the time of land release will also influence final dwelling yields.

4.6 Residential Density Coding

The Structure Plan offers a range of density code 'bands' commensurate with the topographic and natural constraints of the site. These bands range from R5-R15, R10-R30, R20, R20-R30 and R20-R40.

The lower density of the nominated range represents a base code for the Precinct with the higher density to be allocated in accordance with the locational criteria outlined in Part 1, Clause 4.6.

The broad R5 to R40 density range offers a flexible minimum and average lot product in response to topographic and environmental constraints, as well as proximity to the Kingsford Townsite and key transport routes. The range also seeks to maximise opportunities for diversity in lot product and housing typologies, enabling the Structure Plan design to evolve to suit market demand at the time of staging release.

A specific density coding will be allocated to residential lots at the time of subdivision application.

Within each of the above density bands, density will generally increase in response to amenity and decrease in response to topography.

4.6.1 Residential R5 - R15 Precinct

This density coding 'band' applies to the areas located farthest from the Kingsford Town Centre, on the steepest topography in the north-eastern portion of the structure plan area, as a sensitive transition to the Darling Scarp. A mix of lots is envisaged, encompassing larger lifestyle lots with built form designed sensitively to building envelopes and more traditional homes.

The R5 density coding will apply as the base code. The relatively higher densities between R10 and R15 will be located in general proximity to public open space, key distributor roads and bus routes.

The lower R5 density code also applies to lots located directly adjacent to the rural zoned land to the east.

4.6.2 Residential R10 – R30 Precinct

Located away from the Kingsford Town Centre, on steeper topography and for the eastern portion as a context sensitive transition to the scarp. A mix of residential lot types and built form is proposed, ranging from larger lots to cottage lots.

The R10 density coding will apply as the base code. The relatively higher density coding within the ‘band’ will generally apply to lots in proximity to public open space, key distributor roads and bus routes.

Proximity generally defines those lots within a 250m walkable catchment of a public open space area and within a 200m walkable catchment of designated public transport route.

The lower R10 density code also applies to lots located directly adjacent to the rural zoned land to the east.

4.6.3 Residential R20 Precinct

Located on the northern boundary of the Structure Plan area, this small isolated cell will deliver residential lots in keeping with the existing residential area to the north and west.

4.6.4 Residential R20 - R30 Precinct

Located in the northern portion of the Structure Plan area on generally flat land. The R20 code will apply as the base code. A mix of residential lot types and built form is proposed.

The higher R30 density code will apply to ‘Residential’ zoned lots where the following criteria is met;

- a. the lot is created within a 100m walkable catchment of a public open space; and

This R-code range will allow for the delivery of project homes for first homebuyers while also reflecting the benefits of locating R30 lots / homes close to or overlooking POS.

4.6.5 Residential R20 – R40 Precinct

Located adjacent the Town Centre and includes the gently sloping land running north-south between the Ki-it Monger Brook and the southern boundary of the structure plan. The R20 code will apply as a base code. The R30 coded lots are intended to be located in close proximity to or overlooking POS. The R40 coded lots will provide some housing diversity / affordability close to the primary school and town centre.

5.0 Implementation

5.1 Acoustic

Transportation Noise Assessment's have been prepared by Herring Storer to address the adjoining regional and district road networks (refer Appendix 2).

These assessment were undertaken in accordance with the WAPC's updated State Planning Policy 5.4 – Road and Rail Transportation Noise and Freight Considerations in Land Use Planning (SPP 5.4), with the key findings as follows.

The acoustic assessment's carried out for the Structure Plan area found that without mitigation, 'noise targets' set by SPP 5.4 would be exceeded for dwellings close to Chittering Road.

5.1.1 Pearce RAAF Base

With respect to potential noise from the Pearce RAAF Base, the acoustic assessment found that the development is located outside the Australian Noise Exposure Forecast (ANEF) 20 contour. Hence, residential development without any requirement for noise amelioration, is acceptable within this development.

5.1.2 Great Northern Highway

To mitigate the noise impacts for Great Northern Highway, two design options are provided:

- An access road be constructed between the first row of residences and Great Northern Highway, such that residences front Great Northern Highway. 'Quiet House' Design is required for the 'first row' of dwellings fronting Great Northern Highway.
- If the first row of residences to the Great Northern Highway is located at or outside the 60 dB(A) contour, then with the inclusion of a 2 metre highback fence, residences may back on to Great Northern Highway (i.e. back yards to the Great Northern Highway). To then achieve compliance "Quiet House" design requirements as outlined for either Packages "A" or "B" would be required, depending on dwelling setbacks.

All affected residential lots will require a notification on Title where noise targets are exceeded.

5.1.3 Chittering Road

The results of the acoustic assessment indicate that noise received at residences located adjacent to Chittering Road would, with the exception of a small section of the development, comply with the above acoustic criteria. Apart from this small section where development could occur within the 55 dB(A) contour, there are no acoustic requirements.

For the section of the development within the 55 dB(A) contour, standard construction would be acceptable and only notification on titles would be required.

The recommendations above for both Great Northern Highway and Chittering Road are made for single storey dwellings. Specialist acoustic advice should be sought for double storey dwellings.

5.2 Bush Fire Management

An updated Bushfire Management Plan (BMP) (13 September 2021) has been prepared by Strategen (refer Appendix 1); this report prepared in accordance with the WAPC's Guidelines for Planning in Bushfire-Prone Areas 2015, and SPP 3.7: Planning in Bushfire Prone Areas, and the Australian Standard AS3959-2009 Construction of buildings in bushfire prone areas (AS3959) (Standards Australia 2009).

The assessment of the existing vegetation within the Structure Plan area (Figure 4 of Appendix 1) identified that vegetation within the Ki-It Monger Brook foreshore area and internal Conservation Category Wetland (CCW) on Lot 1354 Great Northern Highway as permanent extreme bushfire hazard considerations. The adjacent Bush Forever Site No.86 was also identified as an 'extreme' bushfire hazard. All other woodland, shrubland and grassland within the Structure Plan area were assigned 'moderate' levels of bushfire hazard.

With respect to the post-development scenario, the BMP takes a precautionary approach to the allocation of bushfire hazard levels. As such, the 'extreme' and 'moderate' levels of bushfire hazard identified in the pre-development assessment remain consistent in the post-development assessment with the exception of cleared areas which represent a 'low' bushfire hazard.

The post-development scenario will be revisited at the subdivision stage where further detailed landscaping and lot layouts will be available.

It should be noted that where of dwellings are within 100m of vegetation assessed as having 'extreme' or 'moderate' bushfire hazard level implementation of increased building construction standards may be required.

The proposed movement network (explored further in Section 5.3) appropriately satisfies the requirements of the Guidelines for Planning in Bushfire Prone Areas with suitable linkages proposed to future and existing development on adjacent landholdings. Two primary north-south linkages traverse the Structure Plan area, ensuring all residents and visitors of the development are provided with at least two vehicular access routes connecting to the surrounding public network at all times. In total, five significant access and egress points are proposed by the Structure Plan.

5.3 Proposed Movement Network

An updated Transport Impact Assessment (September 2021), prepared by Transcore, identifies projected traffic volumes and suggested road hierarchies in and adjacent to the Structure Plan area (Appendix 5 refers). Key findings from the report include:

Access to the Structure Plan area is proposed via the following key entry points:

- A roundabout treatment at the intersection of Chittering Road and Maroubra Avenue to allow full movement connection into the Structure Plan area.
- A key 4-way intersection on Great Northern Highway, near the District Activity Centre. This may either be a signalised intersection or a roundabout.
- A key 3-way intersection on Chittering Road, south of Sacri. This is the northern access point of the Chittering Road re-alignment through the site.
- Two major access and egress points are provided within the south of the Structure Plan area, which will connect to future development sites.
- One additional major access point is provided to the north, linking with existing residential development.
- Other minor points of access and egress, to be detailed at future planning stages, will be provided within the Structure Plan area to ensure a legible road network.

The proposed road hierarchy for the Structure Plan area is illustrated in Figure 4.

The road hierarchy focuses on the provision of three key north-south roads:

- The existing Chittering Road which is re-aligned to enter the Structure Plan area. The existing portion of Chittering Road connecting with Maroubra Road is an Integrator B. The portion of Chittering Road south of Maroubra Road is a Neighbourhood Connector A which provides access into the Structure Plan;
- Neighbourhood Connector A road which runs within the Structure Plan to the west. This provides connection from the District Activity Centre and the future school site to northern section of the Structure Plan across Ki-It Monger Brook.
- Neighbourhood Connector A which runs within the Structure Plan to the east. This provides connection through the Structure Plan area to the hinterland to the north.

The road network is based on a modified grid format; this provides a legible road hierarchy providing residents with defined directional ('way finding') routes to key nodes within and around the site. The key north-south roads serve as the connection into the Structure Plan area and the feeder roads to all lower order Neighbourhood Connectors and Access Streets.

Where lots front a road over with a volume of 5,000vpd or more, they are to be designed either so vehicles entering the street can do so travelling forward or provided with alternate forms of vehicle access.

A description of each of the proposed internal roads included in the Structure Plan area is provided herein.

5.3.1 Integrator B

Integrator B roads are proposed in the Structure Plan area in two locations:

- Along the existing Chittering Road alignment, north of Maroubra Avenue; and
- From the four-way intersection of Great Eastern Highway to the District Activity centre, connecting to two Neighbourhood Connector A roads;

With respect to the existing Chittering Road alignment through to Maroubra Road, a variation to the standard LN Integrator B cross section of 25.0m – 29.2m is proposed at 20m. The variation is incorporated on the basis that this existing section of Chittering Road is constrained by land nominated as Bush Forever on its western boundary and Public Open Space, landscaping or proposed frontage roads within the Structure Plan area on its eastern boundary.

The constraints on the eastern boundary negate the requirements for on-street parking for this section of Chittering Road and substantially reduces the verge width required for underground services.

The 20.0m cross section includes 7.0 of trafficable pavement, two 1.5m cycle lanes, 2.0m median strip and 4.0m verges to both sides. The design intent is to maximise retention of existing trees and, overall, to create a low speed environment that will help integrate the existing town with the site. An indicative depiction of this cross-section is provided below as Figure 17.

The southern Integrator B section, connecting through to Great Northern Highway, is expected to have a road design and width in accordance with LN. The road design may consist of a cross-section between 25.0m and 27m.

This 2-lane boulevard style road may comprise 7.5m wide pavements, incorporating 3.2m carriageways, 1.8m cycle lane and 2.5m on-street parking bays, a 3.0 - 4.0m central median and 3.5m – 5.0m verges to provide a suitable space in which to accommodate landscaping and a shared path.

Verges may be further reduced if parking is embayed. An indicative depiction of this cross-section is provided below as Figure 18.

Width of the road design will respond accordingly to environmental and urban design factors such as tree retention and proximity to the District Activity Centre.

Integrator B roads are suitable for traffic flows up to 15,000vpd and can accommodate traffic flows up to 20,000vpd with suitable intersection treatments.

FIGURE 8: Integrator B Cross Section 20m

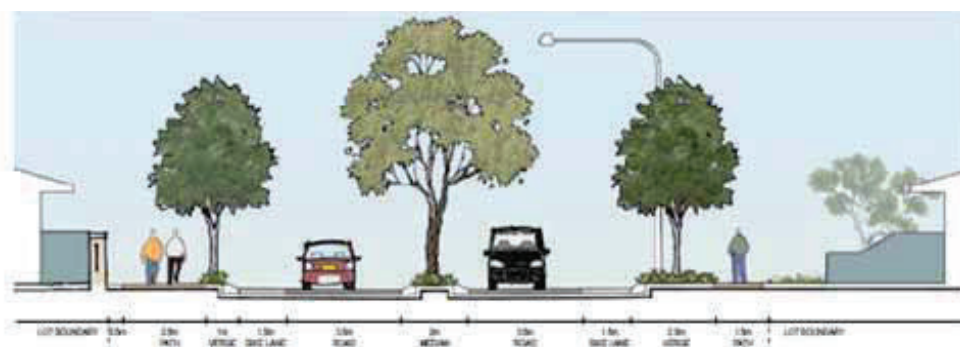
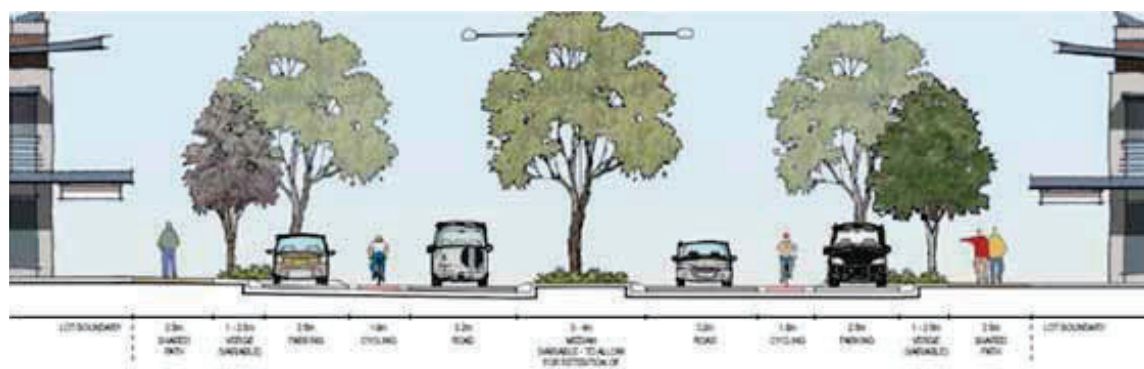


FIGURE 9: Integrator B Corss Section 25-27m



5.3.2 Neighbourhood Connectors

A mix of Neighbourhood Connector A and B roads are proposed throughout the Structure Plan area and primarily facilitate key east-west linkages.

5.3.3 Neighbourhood Connector A

The western 'north-south' Neighbourhood Connector A will provide a key spinal road linkage from development in the north, to future District Activity Centre and school site.

The main difference between Integrator B and Neighbourhood Connector A cross-sections is the width of the median (6.0m compared to 2.0m).

The road design will generally consist of a 7.1m single carriageway which incorporates 2.1m on-street parking, a 1.5m cycle path and 3.5m trafficable pavement. The Neighbourhood Connector A also includes a 4.1m verge (which may be reduced if parking is embayed) and a 2.0m median.

Where the Neighbourhood Connector A acts as an extension of the existing Chittering Road alignment a reduced road reserve of 20.0m may be accepted where on-street parking is not required. An indicative depiction of this cross-section is provided below as Figure 19.

The road design may potentially widen to accommodate a 'living stream'. The 'living stream' is intended to convey stormwater within dedicated road reserve and provide a 'green-link' as reflected in the Landscape Strategy.

The road design under both scenarios (status quo and 'living stream') will be sufficient to accommodate shared paths, dedicated on-street parking, landscaping/tree planting and provision of infrastructure services.

Neighbourhood Connector A roads may accommodate traffic volumes up to 7,000vpd.

5.3.4 Neighbourhood Connector B

The proposed Neighbourhood Connector B roads provide supplementary east-west connectivity within the Structure Plan area. The primary difference between Neighbourhood Connector B and Neighbourhood Connector A is the lack of a median strip as well as dedicated cycle path.

The road design will generally incorporate a 19.4m cross section which comprises a 7m wide trafficable pavement and 6.2m wide verges on both sides which incorporate on-street parking, footpath and landscaping. Similar to Neighbourhood Connector A, the verge width may be reduced if embayed parking is provided.

Alternatively, subject to detailed design, a reduced trafficable pavement width of 6m may be proposed and offset with a median strip and/or additional landscaping as well as potential for footpaths on both sides of the street.

Neighbourhood Connector B roads are suitable for traffic flows up to 3,000 vpd.

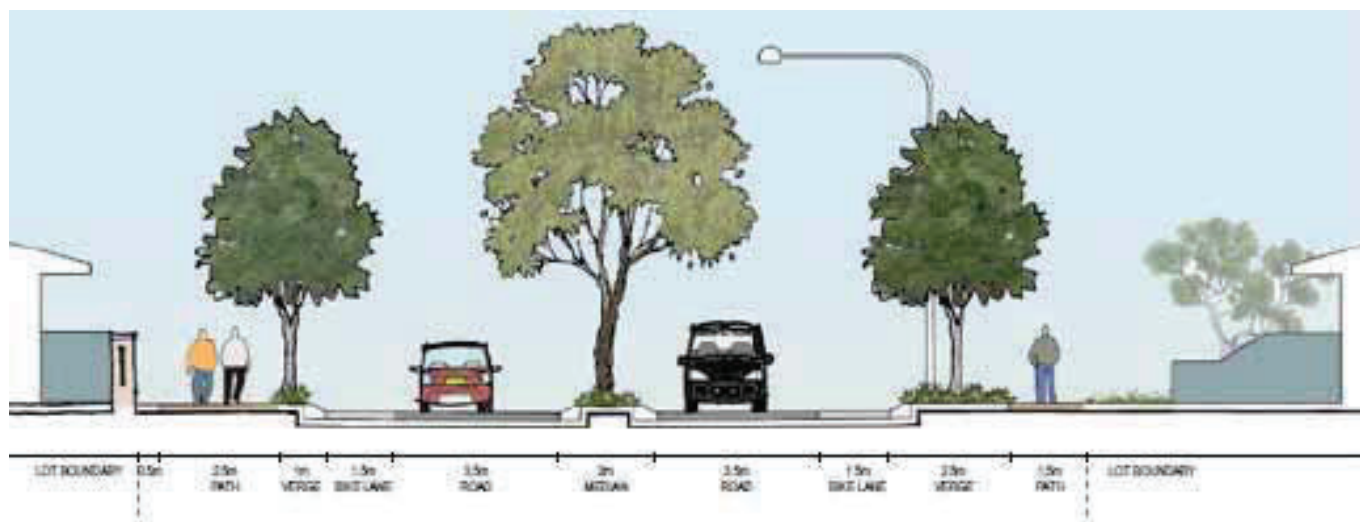
5.3.5 Access Streets

Generally, local access streets serving residential land uses will comprise 16m road reserves with 5.5m wide trafficable pavement, 4.0m verges to each side (incorporating 1.5m footpaths) as well as the opportunity for a 2.5m on-street parking bay to one side.

Projected traffic volumes for this type of road are expected to be less than 1,000 vpd.

Where fronting public open space, Access Street verges may be reduced to minimum 2.5m depending on the location and alignment of services, street parking and pedestrian traffic.

FIGURE 10: Neighbourhood Connector A Cross Section 20m



5.3.6 Public Transport

The Structure Plan area currently has access to the 311 bus service which runs on Great Northern Highway adjacent to the Structure Plan area. The 311 provides six bus services each way on weekdays and two on Saturdays, Sundays and public holidays. It is also noted that the DSP envisages a bus depot within the DAC or surrounds.

The Structure Plan design allows for bus services on all of the proposed Neighbourhood Connector and Integrator B roads, which are a suitable standard to accommodate bus services. This allows flexibility for the Public Transport Authority to plan future bus routes within this area.

5.3.7 Pedestrian and Cycle Infrastructure

In accordance with the requirements of Liveable Neighbourhoods, paths are to be provided to both sides of all Integrator B and Neighbourhood Connector roads, with at least one side being a shared path.

All Access Streets are to have a shared path or footpath on at least one side of the carriageway subject to local demand.

5.4 Landscape Strategy

A Landscape Strategy (Appendix 6), including a Landscape Master Plan has been prepared by Emerge Associates in support of the Structure Plan.

The positioning and configuration of POS areas is influenced by the desire to provide a continuous east-west 'green-link' through the Structure Plan area; this to enhance and improve pedestrian connectivity and synergy between key POS areas.

The 'green-link' and 'linear' POS layout will enable a safe, attractive and appealing pedestrian link (focus) across the entire Structure Plan area. Also of importance is the role it will play in providing a drainage function.

A total of 15 'neighbourhood' POS areas and one 'local' POS area is proposed throughout the Structure Plan area. These areas of POS will generally be informal in nature and characterised by revegetation and native parkland plantings to encourage passive recreation uses. Additionally, they will provide local residents with areas of localised turf for informal active recreation.

POS 17 is significantly larger than the other 'neighbourhood' POS providing approximately 2.94ha of creditable open space. The purpose of this POS is primarily to provide for the retention of trees in an area nominated as a 'specific commitment area' under the Draft Green Growth Plan.

Linkages with adjoining residential streets and the linear POS network will provide the necessary access to these significant areas of POS. The POS areas will form an interconnected series of spaces along the linear park network, each with the potential to offer rest areas for elderly or disabled residents, or exercise stations for others.

Drainage areas may be required within these areas of POS. Where drainage is required landscaped basins will be provided to serve a recreational and amenity function. Drainage swales catering for events greater than a 1:5 event will have turf to enable multiple use and ease of maintenance.

Within each POS, the extent of hardscape and 'urbanity' of the space will increase in proximity to the Town Centre.

The POS are proposed to create areas of local amenity within 400m of most dwellings.

5.4.1 Linear Open Space Network

In order to address the requirements of retaining site topography and the principles of protecting existing trees and ecological linkages where possible, the Structure Plan has incorporated a series of linear open spaces.

The design intent of these spaces is to rehabilitate existing vegetation as well as incorporate existing stands of isolated trees and drainage alignments. Through respecting the existing topography in these areas, the linear POS will provide a necessary drainage function as well as provide visual amenity to the public realm.

As surrounding lots and roads required imported fill to ensure suitable structural conditions for housing, these linear parks will sit at a lower grade. This will ensure that drainage will flow towards these areas and discrete biofiltration and detention basins will be incorporated along the length of the linear parks. A system of inlet and overflow structures will ensure designated parkland areas are kept dry and usable.

Linear parks and widened road reserves, as well as serving environmental and drainage function, also provide an efficient means of supporting a legible cycle and pedestrian network. This network will be designed to encourage passive surveillance from overlooking residents in accordance with Liveable Neighbourhoods and best practice in terms of 'Designing out Crime'.

5.4.2 Living Streams

Due to the requirement to convey stormwater reliably away from high use areas; a system of shallow 'living streams' will be created in the larger POS areas, broader sections of linear parkland and widened road reserves. This system will see to mimic pre-development flows and enable upstream bio-filtration and recharge of the groundwater table.

Through the linear parks the living stream may include an interface with a dual use path (DUP). There will be native shrub planting on the banks and nature reed/sedge planting to enhance nutrient uptake. Bank stabilisation is to be incorporated into the design and a variety of tree species will be used to provide a diverse tree canopy. Treatment along the length of the stream will be dependent upon the width of the corridor and the engineering constraints. The living stream will provide not only a viable drainage function but also a variety of ecological zones and restoration opportunities.

5.4.3 Ki-It Monger Brook

The Ki-it Monger Brook provides a valuable natural landscape resource that contains existing remnant vegetation along a natural drainage corridor. Existing remnant vegetation is in a degraded state, however rehabilitation works will be undertaken interlaced with passive recreation opportunities through walking trails and formalised parkland nodes.

The interface area with the Ki-It Monger Brook will consist of rehabilitated endemic planting interlaced with passive recreation opportunities through walking trails and formalised parkland nodes. These nodes will form Neighbourhood POS and provide settings for picnics and informal gatherings as well as opportunities to incorporate nature play areas. Supplemental planting adjacent to the Ki-it Monger Brook will limit direct public access and where possible an informal dual use path system may extend along the length of the interface area to define public use and to discourage turf and weed encroachment. It is not proposed that any drainage be introduced into the interface areas beyond that required to maintain pre-development flows.

FIGURE 11: Ki-it Monger Brook Cross Section



5.4.4 Street Trees

Where possible, the retention of existing stands of scattered and isolated trees may be incorporated into public open space or through the creation of wider road reserves.

Street trees are a desirable design element to increase shade and amenity. The selection and placement of street trees may vary dependant of the road hierarchy. It is proposed that along major roads, street trees will form a strong visual avenue, and not impede traffic flow, safety or sightlines.

In residential streets, the roads may vary in character from precinct to precinct; however they are characterised as smaller scale pedestrian friendly environments. Therefore, street trees may be of a smaller scale and take advantage of passive solar principles allowing summer shade and winter sun. As the road reserve widths may vary to allow for the retention of existing vegetation and the interconnection of the linear park network, it may be possible to retain clusters or groupings of trees within road reserve. This will be investigated and reviewed at the detailed design stage.

5.5 Public Open Space Contribution

A POS Schedule has been prepared for the Structure Plan area (refer Table 3) which illustrates compliance with the 10% creditable POS requirement in accordance with Liveable Neighbourhoods. The location of each area of POS is identified on Figure 21.

The areas of POS within the Structure Plan area have been separated into broad categories based on their specific treatments and design. The Structure Plan proposes a total of 15 areas of creditable Public Open Space (POS).

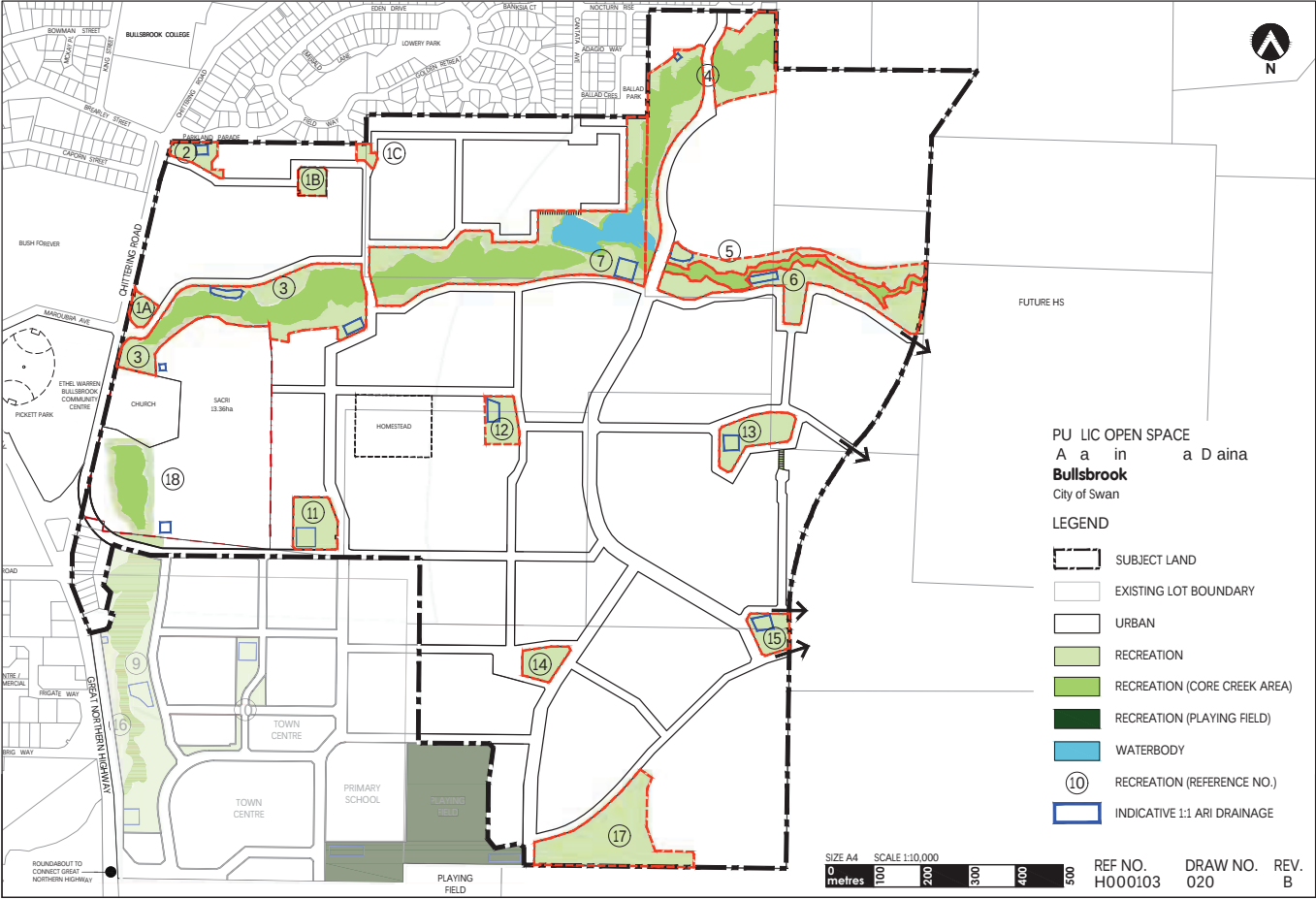
TABLE 2: Public Open Space Schedule

GROSS SITE AREA			207.32 ha
DEDUCTIONS			
Church	2.06 ha		
Recreation (Core Creek Area)	13.20 ha		
1:1 Year Drainage	1.66 ha	16.92ha	
Gross Subdivisible Area			190.4 ha
Public Open Space @ 10%			19.04 ha
PUBLIC OPEN SPACE CONTRIBUTION			
May Comprise:			
Minimum 80% unrestricted public open space		15.23 ha	
Maximum 20% restricted use public open space		3.81 ha	19.04 ha
UNRESTRICTED PUBLIC OPEN SPACE SITES			
Local and Neighbourhood Parks (area minus 1:1 year drainage area)			
1A		0.30 ha	
1B		0.35 ha	
1C		0.16 ha	
1 (Total 1A + 1B + 1C)	total		0.81 ha
2			0.47 ha
3			2.87 ha
4			1.45 ha
5			1.40 ha
6			2.12 ha
7			3.61 ha
8			
9			PP
10			PP
11			0.98 ha
12			0.67 ha
13			1.67 ha
14			0.72 ha
15			0.49 ha
16			PP
17			2.94 ha
18			1.16 ha
TOTAL			21.36 ha
RESTRICTED USE PUBLIC OPEN SPACE SITES			
Drainage filtration area between 1:1 and 1:5 year (forms part of the local and neighbourhood parks)	0.70 ha		
TOTAL			22.06 ha
Public Open Space Provision	0.70 ha	21.43 ha	11.59 %

(PP - included in Precinct Plan)

The POS Schedule will be continually reviewed under the more detailed subdivision and engineering design stages, as drainage provision, earthworks and nett residential development cells are further adjusted.

FIGURE 12: Public Open Space



5.6 Water Management

A Local Water Management Strategy (LWMS) has been prepared for the Structure Plan area developed in accordance with Better Urban Water Management (WAPC 2008), State Planning Policy 2.9 Water Resources (WAPC 2006) and Planning Bulletin 92 Urban Water Management (WAPC 2008) (Appendix 3 refers).

The below information represents a summary of the primary objectives and strategies outlined in the LWMS report:

- Utilise fit for purpose water sources throughout the development by abstracting groundwater from the Perth Superficial Aquifer from the Cockman Bluff Subarea.
- Achieve a consumption target for water of 100 kL/ person/yr, including not more than 40–60 kL/person/year scheme water through the use of water efficient fixtures and fittings within households, as well as encouraging homeowners to install rainwater tanks (amongst other water wise practices in the home).
- Retain and treat stormwater runoff from constructed impervious surfaces from the first 15 mm rainfall event. To achieve this the majority of lots will have onsite soakwells whilst bio-retention basins will be used for retaining, treating and infiltrating the first 15mm rainfall event from road reserves and a small number of connected lots.
- Investigate opportunities to incorporate street-scale infiltration devise (e.g. tree pits and rain gardens) where possible.
- Incorporate a pit and pipe system to ensure roads will remain passable in the 5-year rainfall event.
- Protection of infrastructure and assets from flooding by ensuring habitable floor levels provide a minimum 0.5m vertical clearance from watercourse flood levels and 0.3m clearance from local drainage systems.
- Provide storage and delineate flow paths for the 1% AEP event. This will be achieved by providing flood storage to maintain the pre-development hydrology of the Ki-it Monger Brook and provide flood paths for overland flows within the Structure Plan area along road reserves.
- Maintain clearance between the finished lot levels and groundwater level of at least 1.2m.
- Groundwater quality leaving the site should be the same, or better, than that entering the site. This can be managed through the minimisation of fertilizer and pesticide use in Public Open Space and streetscapes.
- Utilise appropriate structural and non-structural measures to reduce nutrient loads to the Ki-it Monger Brook and downstream waterways.

- The LWMS also provides a comprehensive summary of the existing environmental values of the Structure Plan area, which are based on site-specific studies undertaken and review of publicly available data. The characteristics and environmental values of the Structure Plan area and guidance provided by National and State policies and guidelines relevant to urban water management have guided the design criteria and propose a contemporary best practice approach to achieving the design objectives for water management.

The LWMS demonstrates that the design approach for the Structure Plan area is consistent with a best practice WSUD approach, that the water management objectives can be achieved within the spatial allocation of the Structure Plan, and that the requirements of the relevant State and local government policies and guidelines will be satisfied.

5.7 Services and Infrastructure

A Servicing Report (Appendix 7 refers) has been prepared in support of the Structure Plan and is summarised herein.

5.7.1 Ground Conditions

The following is a summary of the investigative reporting provided by Galt Geotechnical Consultants and is an overview of the likely soil types that will be encountered and proposed remedial measures.

Mapping indicates that the site is underlain by a variety of soil and rock types. The western part comprises mainly soil deposits while the eastern part is underlain by shallow rock and rock outcrop. The following notes are relevant:

- Generally soils over the western portion of the site are sandy overlaying clay/sandy clay.
- Generally soils over the eastern portion of the site are clays/clayey sand overlaying rock (siltstone/gravel/gneiss).
- The soils are generally moderate to high reactive clay/clays soils with high percentage fines and low permeability.
- The site is predominantly classed as M abd S, with some existing class A in the northern portion of the site.
- The general remediation suggested is:
 - Strip 100mm topsoil and grub, remove deleterious material.
 - All excavated sand shall be reused as inert structural fill. The underlying clayey sand can be used for bulk fill (non-structural) only.
 - Proof roll and lay inert clean structural fill with less than 5% fines at depths relevant to required classifications (>1.8m fill for class A, 1-1.8m fill for class S).
- For areas where subgrade has >0.5m inert structural fill a CBR of 12 can be adopted for pavement design.
- Drainage can be managed via infiltration only where clean sandy fill is present to a depth of 1.2m. Detailed geotechnical investigations are required prior to further development.

It is recommended that an allowance is made to fill the class M areas of the site by either 0.7m or 1.5m respectively to achieve class S or A classifications in accordance AS2870- 2011 “Residential Slabs and Footings”. This is based on the conservative assumption there is an average of 300mm of sandy fill overlaying the site. Ultimately this will have to be confirmed by intrusive geotechnical investigations.

5.7.2 Sewage

The Water Corporation (WC) advised the project engineers (JDSi) that the development is located within the current scheme planning and a connection to gravity sewer has been provisioned for. The current Bullsbrook WWTP only services the Bullsbrook town centre and is near capacity.

The Water Corporation has recently advised that the WWTP will be converted into a major transfer station with the additional flows created by the landholdings being rezoned to be pumped from Bullsbrook to Ellenbrook via a major transfer pipeline. The Water Corporation has advised that this project should be completed by mid 2023.

5.7.3 Water Supply

The Water Corporation (WC) has advised that the Structure Plan area is located within the current scheme planning and a connection to water reticulation has been provisioned for under an upgrade of the existing infrastructure located within Great Northern Highway (GNH).

The WC had completed the planning study for the delivery of additional water services to the Bullsbrook area. This included supply to the residential area on the eastern side of Great Northern Highway and Chittering Road including the proposed development site. WC advised that supply to the Structure Plan area would be via a new DN300 distribution main between Great Northern Hwy and Hurd Road installed to the west of the site along Chittering Road.

5.7.4 Power Supply

The Western Power Network Capacity Mapping Tool indicates that there is enough capacity to feed the estimated ultimate 2500+ lots. JDSi can advise that a feasibility study was recently undertaken that indicates the remaining capacity on the existing 22kV feeder adjacent to the development was approximately 4MVA. Beyond the initial supply, reinforcement of the upstream 22kV feeder line, and voltage regulator may also be required. The development will also require a number of transformers, switchgear units and associated low voltage cable and pillar infrastructure to service the lots.

5.7.5 Telecommunications

NBN will be the primary telecommunication service provider for the Structure Plan area. NBN Co has advised that the development can be serviced from their existing infrastructure in the vicinity of the site.

After NBN connectivity for the development has been established at the boundary of the development, connections of future subdivision lots to the network will thereafter be managed stage by stage.

5.7.6 Gas

The Bullsbrook area currently has no reticulated gas network. Reticulated gas is not considered to be an essential service and as such is not required as a condition of subdivision. It is usual practice to install gas reticulation network for the subdivision within a common civil trench at no cost to the developer. If there is an extension required to connect to the nearest high pressure gas main the developer will be required to pay for the trenching to the gas main as a headworks cost.

Consideration may be given to the option of the developer funding the installation of a “dormant” internal gas network to the subdivision vested with ATCo Gas that could be connected into ATCo mains at some point in the future. ATCo have agreed in principle to assess such a proposal and ensure the design meets with ATCo standards.

5.7.7 Roads

The traffic movement patterns for the Bullsbrook area have changed substantially when the Perth Darwin National Highway was constructed with most heavy vehicle traffic moving to the new road from Great Northern Highway. This change has reduced the movements of heavy vehicles adjacent to the Structure Plan area, promoting improved traffic conditions for local vehicles.

All internal roads will be developed to the standards of the City of Swan.

5.7.8 Stormwater Management & Drainage

The Structure Plan area is subject to a drainage strategy which proposes the management of runoff through a pit and pipe system within road reserves, with outfall into bioretention swales incorporated into POS areas. Lot runoff will generally be managed via onsite infiltration where possible.

5.8 Staging

The development of the Structure Plan area will be implemented in multiple stages and is indicative as the timing, location and composition of the future stages will be dependent on market demand.

The staging has commenced in the north-western portion of the site, with access provided via Chittering Road and developed for Display Village, Sales Office and ‘first release’ residential purposes.

The staging will move eastwards and southwards with a view to deliver the District Activity Centre /Town Centre.

The provision of engineering infrastructure and primary internal road network will also need to be staged to suit development demand and/or suitable access at an early stage. A detailed programme for this will be prepared as part of ongoing detailed planning and design of service infrastructure.

Appendix 1

Bushfire Management Plan

(Strategen JBS&G)

Bushfire Management Plan Coversheet

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

Bushfire Management Plan and Site Details

Site Address / Plan Reference: Kingsford Residential Estate

Suburb: Bullsbrook

State: WA

P/code: 6084

Local government area: City of Swan

Description of the planning proposal: Amended Structure Plan

BMP Plan / Reference Number: 60919/137,082

Version: R03 Rev 5

Date of Issue: 13/09/2021

Client / Business Name: Okeland Communities

Reason for referral to DFES

Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?

☐

X

Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the BPC elements)?

☐

X

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

Unavoidable development (in BAL-40 or BAL-FZ)

☐

X

Strategic planning proposal (including rezoning applications)

☒

☐

Minor development (in BAL-40 or BAL-FZ)

☐

X

High risk land-use

☐

X

Vulnerable land-use

☐

X

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

The amended Structure Plan constitutes a strategic planning proposal

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

BPAD Accredited Practitioner Details and Declaration

Name	Accreditation Level	Accreditation No.	Accreditation Expiry
Zac Cockerill	Level 2	BPAD37803	31/08/2022
Company		Contact No.	
Strategen-JBS&G		(08) 9792 4797	

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

Signature of Practitioner



Date 13/09/2021

Okeland Communities
Bushfire Management Plan (amended Structure Plan)
Kingsford Residential Estate, Bullsbrook

13 September 2021
60919/137,082 (Rev 5)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

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Appendix B	Summer wind profiles for Pearce RAAF weather station
Appendix C	Landscape Masterplan (Emerge 2019)
Appendix D	City of Swan Fire Hazard Reduction Notice (as amended)

1. Introduction

1.1 Background

Okeland Communities is developing Kingsford Residential Estate in Bullsbrook as part of an approved Structure Plan, subdivision and staged clearance process. This strategic level Bushfire Management Plan (BMP Rev 5) has been updated to capture detail from the proposed amended Structure Plan in relation to anticipated zoning of new “Residential Development” land in the eastern portion of the site.

The project area applies to the following properties incorporated within the amended Structure Plan area:

- Lots 2, 3, 4, 5, 6 and 2510 Great Northern Highway
- Lots 2 (D061060), 2 (D024417) 7, 8, 9, 10, 1396, 900 and 901 Chittering Road
- Lot 1165 Hurd Road.

The amended Structure Plan (Figure 1) identifies the previously approved Structure Plan and Precinct Plan areas, as well as areas relating to the amended Structure Plan component to the east, which is primarily proposed for residential development, Public Open Space (POS) and neighbourhood connector roads.

A portion of the project area is designated as bushfire prone on the WA *Map of Bushfire Prone Areas* (DFES 2019; Plate 1) due to the extent of on-site and adjacent vegetation. As a result, Strategen-JBS&G has prepared this BMP to inform strategic planning and fulfil the following key objective:

1. Accompany submission of the amended Structure Plan in order to meet planning requirements triggered under Policy Measure 6.3 of *State Planning Policy 3.7 Planning in Bushfire-Prone Areas* (SPP 3.7; WAPC 2015).

The following information is required as part of this BMP to accompany the amended Structure Plan to address SPP 3.7 Policy Measure 6.3:

- results of a Bushfire Hazard Level (BHL) assessment determining the applicable hazard level(s) across the subject land in accordance with methodology set out in *Guidelines for Planning in Bushfire-Prone Areas* (the Guidelines; WAPC 2017) – refer to Section 2.3, Section 2.4, Figure 5 and Figure 6
- identification of any bushfire hazard issues arising from the relevant assessment – refer to Section 2.5
- clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages – refer to Section 4 and Table 3

This BMP has been prepared in accordance with the Guidelines and addresses the above information requirements to satisfy SPP 3.7 specific to the strategic planning stage for this project.

1.2 Purpose and application of the plan

The purpose of this BMP is to provide strategic level guidance on how to plan for and manage the bushfire risk to future assets of the project area by demonstrating a commitment from the developer to implement a range of bushfire management measures at future planning stages. The BMP outlines how future on-site assets can be protected during the summer months when the threat from bushfire is at its peak. This is particularly relevant when existing fire appliances in the area may be unable to offer an immediate emergency suppression response; therefore, development planning and design should aim to provide mitigation strategies that protect future life and property from bushfire as a priority.

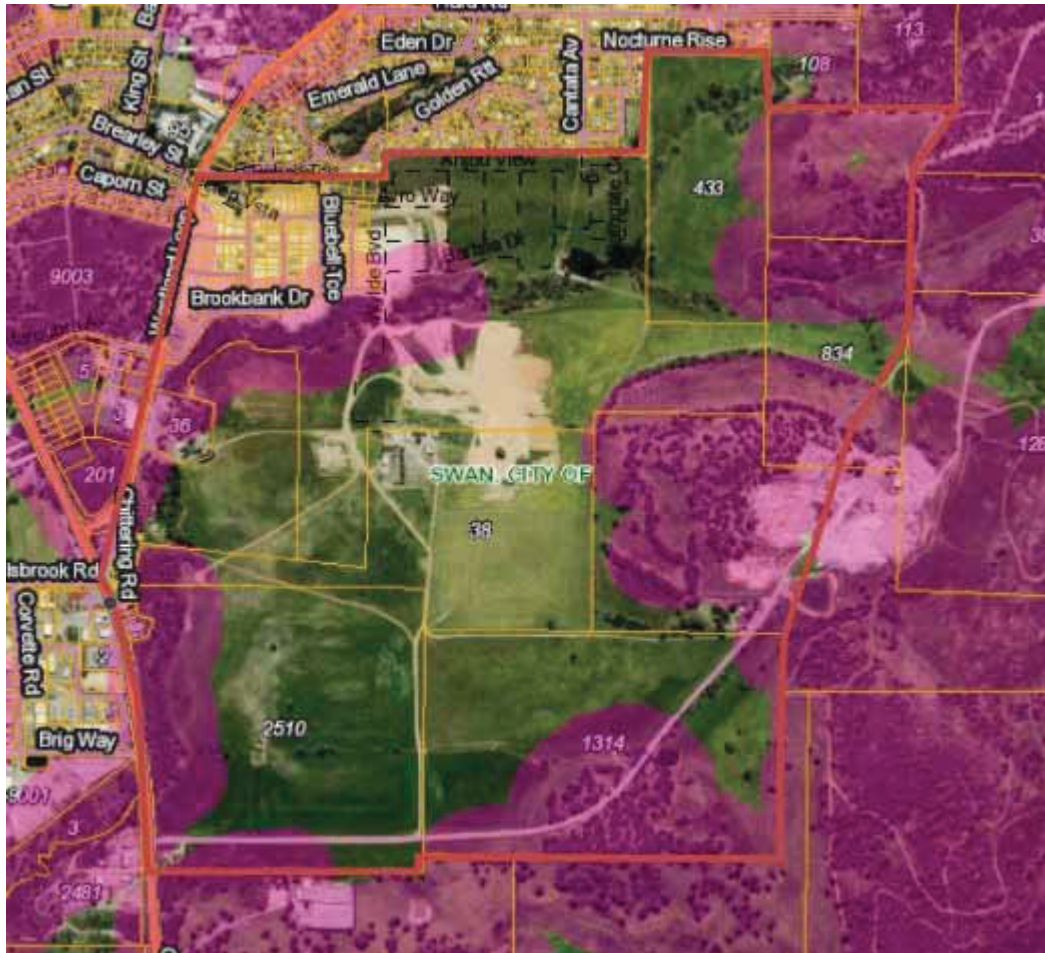
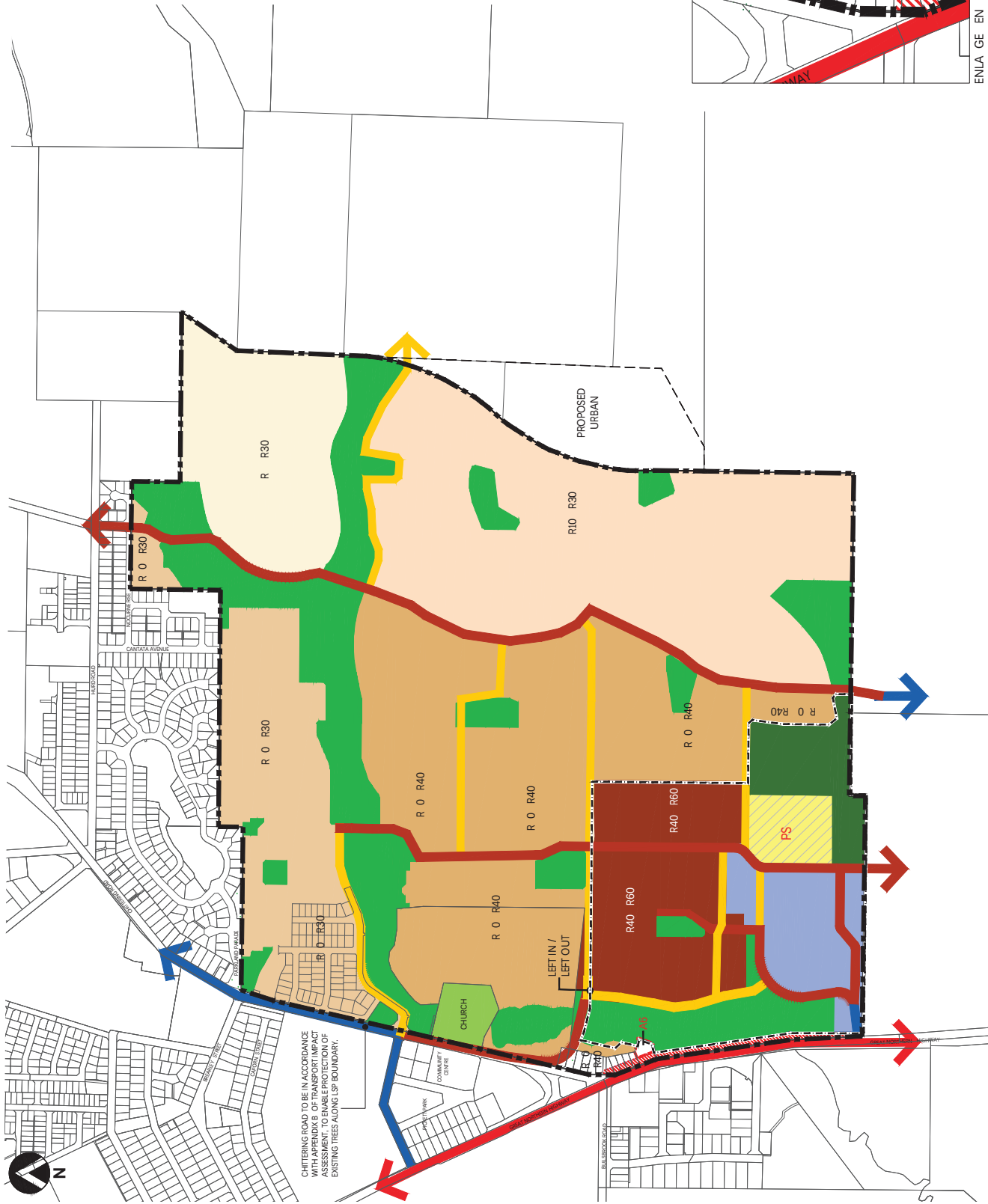
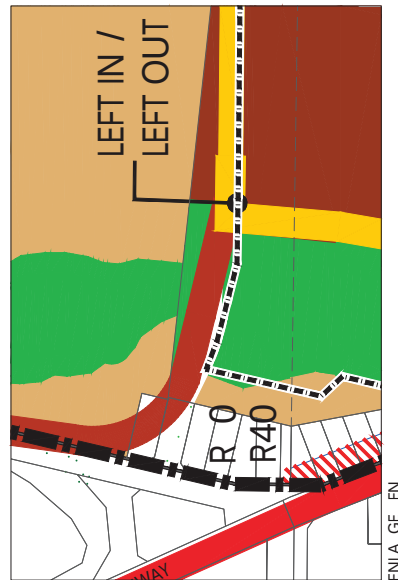


Plate 1: WA Map of Bushfire Prone Areas (DFES 2019)



LEGEND
LOCAL STRUCTURE PLAN BOUNDARY (4.6ha)
AREA SUBJECT TO FUTURE PRECINCT PLAN

- NE
- RESIDENTIAL (R R30)
 - RESIDENTIAL (R10 R30)
 - RESIDENTIAL (R 0 R30)
 - RESIDENTIAL (R 0 R40)
 - RESIDENTIAL (R40 R60)
 - GENERAL COMMERCIAL
 - PUBLIC PURPOSE PRIMARY SCHOOL
 - RECREATION
 - DISTRICT OPEN SPACE
 - PRIVATE CLUBS AND INSTITUTIONS
 - PRIMARY REGIONAL ROAD
 - ADDITIONAL USES SERVICE STATION
 - E E E
 - PRIMARY DISTRIBUTOR
 - INTEGRATOR B
 - NEIGHBOURHOOD CONNECTOR A
 - NEIGHBOURHOOD CONNECTOR B



HATCH | RobertsDay

CADA: AL N A N
SOURCE: MNG
YMMDD: 18101
DWG REF: 006a
PROJECTION: PCG 4

SIZE A3
1:10,000
0 metres

W ADD PROPOSED URBAN AREA
U NEIGHBOURHOOD CONNECTOR ADJUSTED
T UPDATE WITH ACP
S UPDATE TEXT AND PLAN
REV DESCRIPTION

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2. Spatial consideration of bushfire threat

2.1 Existing site characteristics

2.1.1 Location

The project area comprises the following lots in Bullsbrook, located in the City of Swan:

- Lots 2, 3, 4, 5, 6 and 2510 Great Northern Highway
- Lots 2 (D061060), 2 (D024417) 7, 8, 9, 10, 1396, 900 and 901 Chittering Road
- Lot 1165 Hurd Road.

The project area is bound by the following (Figure 2):

- North: existing urban residential development
- South: adjacent rural land
- East: adjacent rural land
- West: Chittering Road, existing urban residential development (northwest), various City-owned land/reserves including Bullsbrook Bush Fire Brigade, vegetated Lots 9003 and 201 (west) and existing light industry (southwest).

2.1.2 Zoning and land use

The project area is currently zoned 'Residential Development' under provisions of the City of Swan Local Planning Scheme No 17.

Undeveloped portions of the project area currently contain grassland used for the grazing of livestock, while the Bullsbrook landfill facility occupies an area east of the site.

2.1.3 Assets

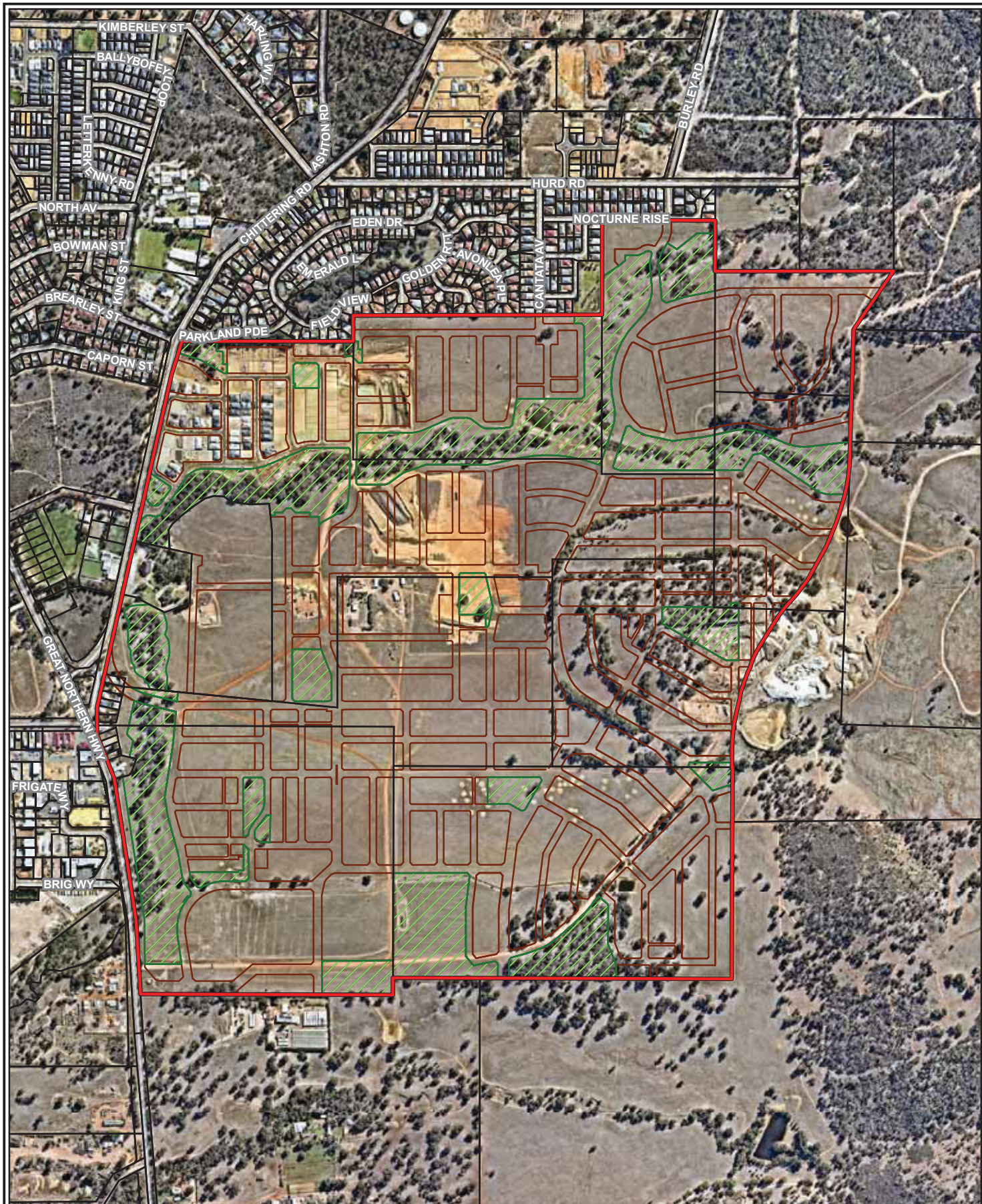
Aside from newly developed portions of the Stages 1 and 2 subdivision approval areas within the site, the project area contains limited property assets in the form of a farmhouse and associated outbuildings. Ongoing urban development will significantly increase these critical assets in that the number of residents, visitors and built assets will be intensified across the subject land.

2.1.4 Access

The project area is currently accessed via Chittering Road from the west and via numerous farm roads accessed from the driveway of the Bullsbrook landfill facility to the south and southeast. The driveway for the Bullsbrook landfill facility is accessed via Great Northern Highway (Figure 2). Aside from newly developed portions of the Stages 1 and 2 subdivision approval areas within the site, there are currently no bituminised access ways constructed within the project area, only a network of farm tracks and private driveways.

2.1.5 Water and power supply

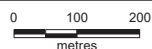
Aside from newly developed portions of the Stages 1 and 2 subdivision approval areas within the site and the existing house within the project area (which are connected to the local power and reticulated water supply), the majority of the project area is not currently serviced by power or reticulated water.



Legend

- Project area
- Cadastral boundary
- POS
- Proposed road reserve
- Roads (MRWA)

Scale 1:12,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50

Z

Job No: 61312

Client: Amex Bullsbrook Unit Trust

Version: A

Date: 31-Aug-2021

Drawn By: jcrute

Checked By: CT

**Kingsford Residential Estate,
Bullsbrook, WA**

SITE OVERVIEW

FIGURE 2



2.2 Existing fire environment

2.2.1 Classified vegetation

Pre-development vegetation classifications have been assessed for this site in accordance with methodology contained within *AS 3959–2018 Construction of Buildings in Bushfire-Prone Areas* (AS 3959; SA 2018). Strategen-JBS&G assessed vegetation classifications within the project area and adjacent 150 m through on-ground site investigation on 12 August 2016 and numerous additional assessments thereafter to support various stages of subdivision and clearance approval through to July 2021.

A summary of vegetation within the project area is provided below and depicted in Figure 3:

- Class B woodland occurs in association within Ki-It Monger Brook, which bisects the project area in the north, then aligns north-south along the site's western boundary
- other small pockets of Class B woodland are scattered throughout the site where canopy cover over grass is more dense
- Class G grassland occurs on all land occupied by pasture grasses/weeds with minimal canopy cover
- non-vegetated areas occur where vegetation has been removed for the construction of tracks, roads, firebreaks and buildings, excluded from classification under Clause 2.2.3.2 (e)
- low threat managed land occurs throughout newly landscaped areas adjacent to Ki-It Monger Brook and landscaping around the existing residence, excluded from classification under Clause 2.2.3.2 (f).

A summary of existing vegetation on land adjacent to the project area is provided below and depicted in Figure 3:

- Class A forest occurs to the east and northeast within properties vegetated with typical intact three tiered Jarrah/Marri forest fuels
- Class B woodland occurs:
 - * along the continuation of Ki-It Monger Brook to the southwest and east
 - * throughout numerous small remnants and linear arrangements to the south and east, including around the existing landfill facility
 - * opposite Chittering Road to the west within vegetated Lot 9003
- Class C shrubland occurs opposite Chittering Road to the west within vegetated Lot 201
- Class D scrub occurs opposite Great Northern Highway to the southwest
- non-vegetated areas to the north, west and south occur where vegetation has been removed for the construction of roads, residential development and the Bullsbrook townsite and these are excluded from classification under Clause 2.2.3.2 (e)
- areas where the vegetation is managed in a low threat, minimal fuel condition such as road verges and managed landscaping are excluded from classification under Clause 2.2.3.2 (f).

Strategen-JBS&G has compiled geo-referenced photographs taken during on-ground site investigation, which are contained in Appendix A and demonstrate the location, direction and classification of the pre-development vegetation extent observed.

Strategen-JBS&G emphasises that the vegetation extent discussed above and mapped in Figure 3 demonstrates pre-development (current) site conditions and does not consider any vegetation modification that will occur as part of proposed development.

2.2.2 Site topography

Strategen-JBS&G assessed pre-development site topography within the project area and adjacent land through a review of topographic contours and on-ground verification (Figure 3). Topographic elevation on site ranges from approximately 120 mAHD (Australian Height Datum) in the northeast and 44 mAHD in the southwest of the project area.

Aside from vegetation within Ki-It Monger Brook, vegetation within the project area is upslope or on flat land relative to proposed development. Ki-It Monger Brook is situated within a narrow, steep-sided gully, with slopes ranging from 4–14 degrees. However, an average down-slope of >0–5 degrees provides a more appropriate reflection of the effective slope under the vegetation with respect to potential bushfire behaviour for the purposes of BAL assessment in recognition that the short, sharp slope variations associated with the banks of Ki-It Monger Brook would not contribute significantly to predominant fire behaviour characteristics for this bushfire scenario.

Classified vegetation identified opposite Chittering Road and Great Northern Highway to the west of the project area was confirmed to be subject to a slight down-slope of >0–5 degrees in relation to proposed development.

2.2.3 Bushfire weather conditions

Worst case bushfire weather conditions

Southwest Western Australia generally experiences a cool to mild growing season in the months of August through to November of each year, followed by four months of summer drought conditions, which is when the potential for bushfire occurrence is at its peak. Worst case (adverse) bushfire weather conditions can occur during this dry period when a low-pressure trough forms off the west coast and strong winds develop from the north or northeast. These conditions are sometimes associated with 'Extreme' or 'Catastrophic' fire dangers, which are consistent with very high temperatures, low relative humidity and very strong winds. Based on the predominant summer climatic conditions of the local area, 'Extreme' and 'Catastrophic' fire dangers normally occur less than 5% of the time during the designated bushfire season, which equates to around six days between December and March (McCaw & Hanstrum 2003).

Predominant bushfire weather conditions

Predominant bushfire weather conditions are those that occur 95% of the time during the designated bushfire season. For Bullsbrook, these generally correlate with average January climatic conditions.

Mean January 9:00 am and 3:00 pm wind profiles for Pearce RAAF weather station (approximately 1 km west of the project area) are contained in Appendix B. These illustrate that the predominant winds during the designated bushfire season are from the east in the morning averaging around 17.9 km/h and from the southwest in the afternoon averaging around 20.4 km/h (BoM 2016).

Mean January 9:00 am and 3:00 pm relative humidity for Pearce RAAF weather station is approximately 48% and 30% respectively, with the January mean maximum temperature peaking at around 33.5°C (BoM 2016).

The predominant bushfire weather conditions discussed above correlate with an average Fire Danger Index (FDI) rating of 'High', as determined using the Commonwealth Science and Industrial Research Organisation (CSIRO) Fire Danger and Fire Spread Calculator (CSIRO 1999).

2.2.4 Bushfire history, fuel age, risk of ignition and potential ignition source

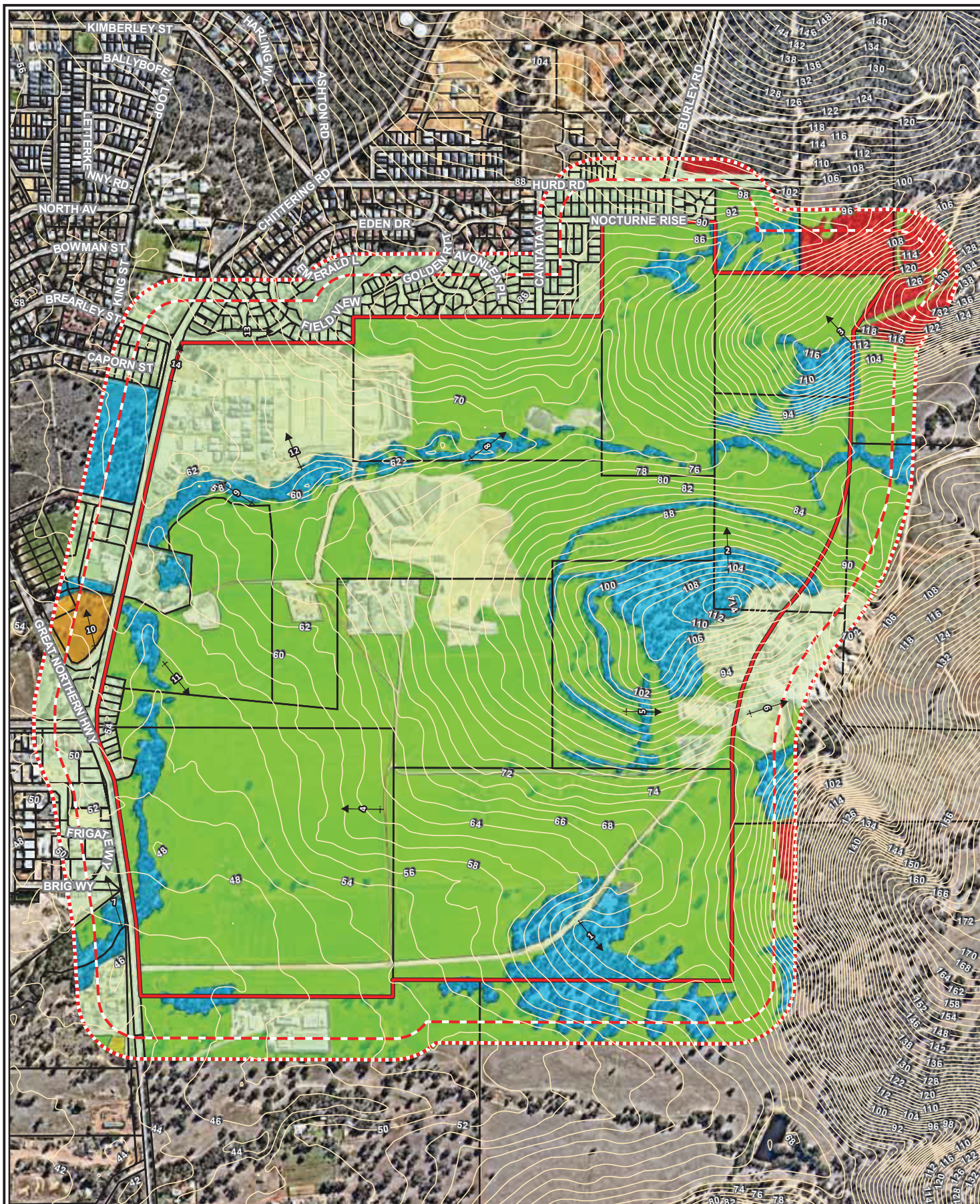
Bushfire history in the project area is infrequent and there is a lack of recent fire evidence over most of the project area; however, recent bushfires in the Perth Hills in 2011, Stoneville/Parkerville in 2013 and Wooroloo in 2021 have highlighted the need to consider bushfire planning for future developments in the area.

Available fuel loads within native vegetation areas are patchy and inconsistent due to variations in vegetation density, litter depth, trash height and the fragmented nature of the vegetation. Rural land to the south, east and west of the project area is a combination of unmanaged grassland, managed low fuels and woodland vegetation.

Since most bushfires are ignited by people, the current ignition risk is low due to the low levels of residency, public access and visitation throughout the site and surrounding rural landholdings. However, Strategen-JBS&G considers that the ignition risk, particularly within the project area, may increase following development intensification and increased levels of public access and resident occupancy at the bushland interface.

The potential sources of ignition in the area are expected to be from:

- deliberately lit fire (i.e. arson)
- lightning strike
- accidental causes, such as vehicle accidents and sparks from vehicle exhausts/machinery
- escapes from fuel hazard reduction burning
- pole-top fires
- incorrect disposal of cigarettes.



Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Topographic contours (mAHD)
- Photo point directions

Vegetation classification

- Class A Forest
- Class B Woodland
- Class C Shrubland
- Class D Scrub
- Class G Grassland
- Clause 2.2.3.2 (e) & (f)
- Roads (MRWA)

Scale 1:12,000 at A4

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metres

Coord. Sys. GDA 1994 MGA Zone 50

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Job No: 61312

Client: Amex Bullsbrook Unit Trust

Version: A

Date: 31-Aug-2021

Drawn By: jcrute

Checked By: CT

**Kingsford Residential Estate,
Bullsbrook, WA**

**PRE-DEVELOPMENT
VEGETATION CLASS
AND EFFECTIVE SLOPE**

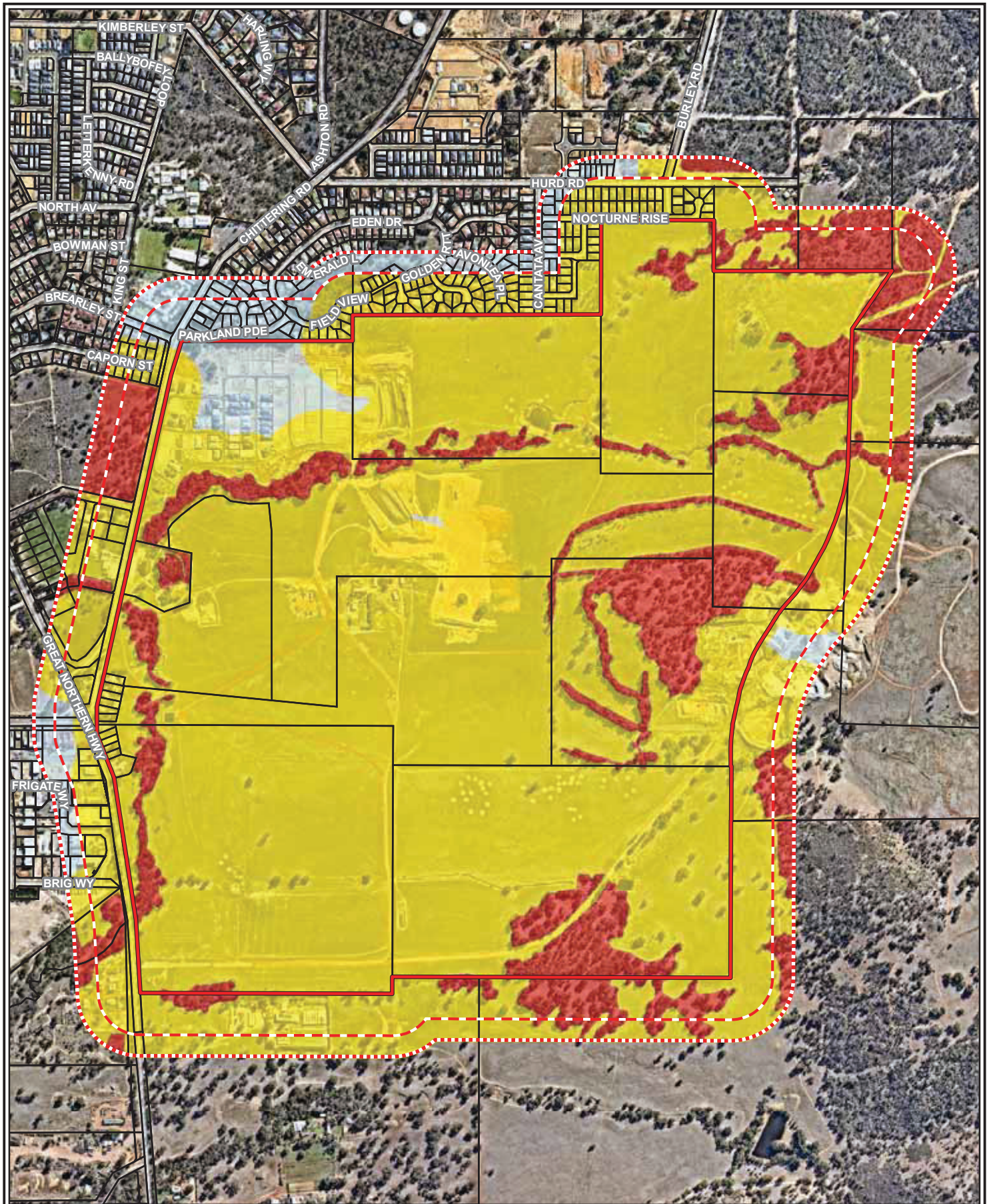
FIGURE 3



2.3 Pre-development bushfire hazard level assessment

Pre-development bushfire hazard levels have been assessed for this site in accordance with methodology contained within the Guidelines, as per assessment results provided in Section 2.2. Strategen-JBS&G has mapped the existing bushfire hazard levels within the project area and adjacent land to indicate location and severity of pre-development bushfire risk and to enable the comparison between pre-and post-development risk. A summary of results is provided below and depicted in Figure 4:

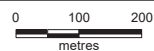
1. All areas of Class A forest, Class B woodland and Class D scrub have been assigned an 'Extreme' bushfire hazard level. These include:
 - (a) existing Jarrah-Marri forest vegetation to the east and northeast
 - (b) existing woodland vegetation along Ki-It Monger Brook
 - (c) existing woodland vegetation retained in pockets and linear arrangements throughout the broader landscape east and south of the site
 - (d) existing woodland and scrub vegetation adjacent west of Chittering Road and Great Northern Highway.
2. All areas of Class C shrubland have been assigned a 'Moderate' bushfire hazard level. This includes existing vegetation within Lot 201 adjacent west of Chittering Road.
3. All areas of Class G grassland have been assigned a 'Moderate' bushfire hazard level. This includes the predominate rural extent within and adjacent south and east of the project area comprising pasture grasses.
4. All areas within 100 m of 'Extreme' and 'Moderate' hazards have been assigned a 'Moderate' bushfire hazard level.
5. All remaining areas that are currently excluded from classification under Clauses 2.2.3.2 (e) and (f) of AS 3959 have been assigned a 'Low' bushfire hazard level. This includes a portion of the existing approved and developed subdivisional area within the site and a small portion of land internal to the landfill facility east of the site.



Legend

- Project area
- 100m assessment area
- 150m assessment area
- Cadastral boundary
- Extreme
- Moderate
- Low
- Roads (MRWA)

Scale 1:12,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50

Z

Job No: 61312

Client: Amex Bullsbrook Unit Trust

Version: A

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**Kingsford Residential Estate,
Bullsbrook, WA**

**PRE-DEVELOPMENT
BUSHFIRE HAZARD LEVELS**

FIGURE 4



2.4 Post development bushfire hazard level assessment

2.4.1 Proposed development cells

The amended Structure Plan (Figure 1) depicts urban development cells throughout the project area. Unless shown specifically as POS for conservation purposes, the majority of urban development cells will be modified from their current grassland/woodland state to reflect broad-scale non-vegetated and low threat managed areas, which will be excluded from classification under Clauses 2.2.3.2 (e) and (f). On this basis, these areas in a post-development state will comprise a low bushfire hazard level, or a moderate bushfire hazard level if situated within 100 m of pre-existing moderate/extreme hazards.

2.4.2 Proposed public open space

The amended Structure Plan (Figure 1) and approved amended Landscape and Irrigation Strategy depicts numerous POS areas throughout the site (refer to Appendix C for Landscape Masterplan). POS areas proposed throughout the site are also shown spatially in Figure 2. The proposed POS typologies include:

- Linear POS: open spaces which provide a connection between smaller recreational nodes (neighbourhood POS) and specifically allows an integration/connection with the Ki-It Monger Brook. Provides legibility and sense of place for local residents. Also enables retention of existing trees and allows for low level drainage conveyance through the site.
- Neighbourhood POS: located throughout the development (3000–5000 m²) and provides local residents with areas of turf and planting for informal kick-about play and passive uses. Also provides seating areas under shelter/shade and are typically within 400 m of most dwellings. Are able to service approximately 600 dwellings within the surrounding area.
- District POS/Playing Fields: approximately 2.5–7 ha and notionally able to serve three neighbourhoods. Provides local residents and community with an open area capable for servicing district sports, events and gatherings. Caters for the combination of passive (including informal play areas) and active recreation and are generally within 1 km of most dwellings. Natural and human made changes in elevation need to be considered in context to district POS as they also serve a drainage function to the development.
- Civic POS: provision for a main street and town/village square within Bullsbrook development. Predominantly hard paved and located at the conjunction of major thoroughfares and town/village centre in order to provide a landmark for community gatherings and events.
- Conservation and Buffer Areas: as the proposed development area includes the Ki-It Monger Brook, conservation and buffer zones are designed to rehabilitate/protect the natural assets of the site to the benefit of the environment and greater community. These areas will provide opportunities for passive recreation (walking trails) and serve a critical role in drainage detention.
- Ki-It Monger Brook: the Ki-It Monger Brook will become the primary POS and ecological corridor of the development. It represents a unique asset which serves a critical ecological role. Sensitive design will ensure existing vegetation will be retained and rehabilitated. This objective will be achieved by designating nodes for recreational/educational opportunities, allowing for vegetated areas to be retained and protected along the existing Brook corridor. Continuous pedestrian/cycling paths will link these interspersed nodes, which include amenities in the form of play spaces, boardwalks and interpretative signage.

Based on the above descriptions and conceptual information contained in the approved amended Landscape and Irrigation Strategy, it is likely that only Conservation/Buffer Areas and Ki-It Monger Brook will comprise post-development classified vegetation in the form of retained/rehabilitated Class B woodland. As such, Strategen-JBS&G's post-development bushfire hazard level assessment depicts these post-development hazards.

Strategen-JBS&G has analysed proposed drainage areas and notes that the majority of these occur in isolated areas of POS that will likely be excludable under one or a combination of Clauses (b), (c), (d) and/or (f) of AS3959. In addition, proposed revegetation of the Ki-It Monger Brook and mapped wetlands is to be in accordance with an approved Foreshore and/or Wetland Management Plan.

As planning stages progress and greater levels of landscaping detail become available, the spatial areas of post-development classified vegetation throughout POS will be accurately mapped to ensure appropriate bushfire responses are incorporated into subdivision design.

2.4.3 Post-development bushfire hazard level assessment

A summary of the post-development bushfire hazard levels are provided below and depicted in Figure 5:

1. Class B woodland associated with proposed Conservation POS areas (as per the approved amended Landscape and Irrigation Strategy) has been assigned an 'Extreme' bushfire hazard level. This includes the conservation component of Ki-It Monger Brook and additional conservation areas to the south and northeast.
2. All classified vegetation assessed outside of the project area will remain as per pre-development conditions, with the corresponding hazards as mapped in Figure 4
3. All areas within 100 m of 'Extreme' and 'Moderate' hazards have been assigned a 'Moderate' bushfire hazard level.
4. All remaining areas that are currently or proposed to be excluded from classification under Clauses 2.2.3.2 (e) and (f) of AS 3959 have been assigned a 'Low' bushfire hazard level. This includes the majority of the internal development footprint, future low threat POS areas and adjacent existing urban development areas to the north and west.

2.5 Identification of bushfire hazard issues

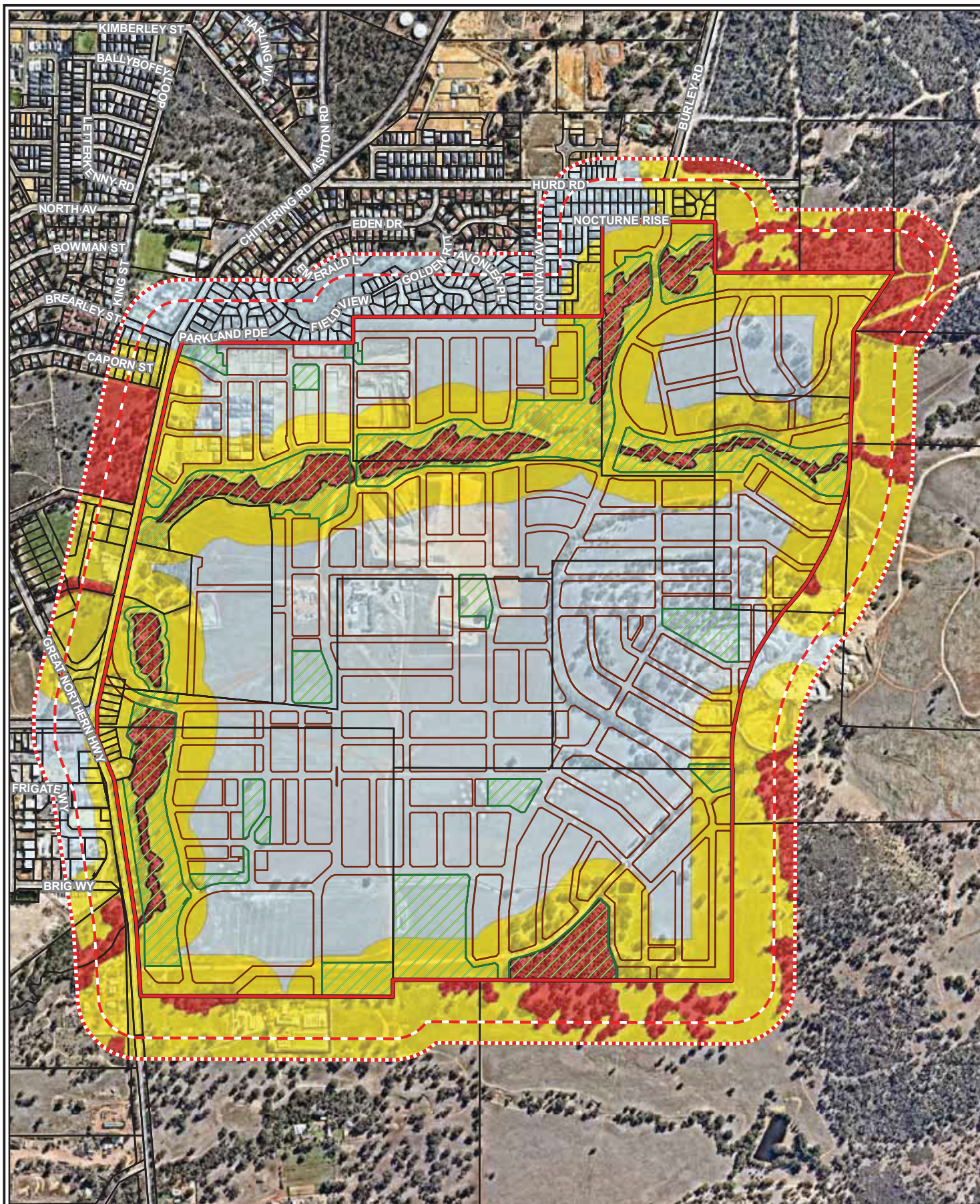
Strategen-JBS&G considers a fire front approaching the site from the northeast to be the worst-case bushfire scenario. This is due to the long bushfire run through forest and woodland vegetation within Burley Park northeast of the project area (approximately 1.5 km in length and within spotting distance from longer bushfire runs to the northeast). Under standard morning weather conditions in summer, the likely prevailing winds from the east may be capable of directing a bushfire towards the project area and the resulting fire behaviour has the potential to escalate over this time and contribute significantly elevated levels of radiant heat and ember attack on the proposed development. However, the proposed clearing and intensification of development on this site will result in a lower overall bushfire hazard level than currently exists. The construction of roads throughout the project area will also enable direct fire suppression at the road and vegetation interfaces.

A similar issue occurs to the southwest during standard afternoon conditions. This is due to the bushfire run through woodland vegetation associated with Ki-it Monger Brook vegetation that exits southwest of the project area (approximately 2.0 km in length). Under standard afternoon conditions in summer, the likely prevailing winds from the southwest may be capable of directing a bushfire towards the project area and the resulting fire behaviour has the potential to escalate over this time and contribute moderate to elevated levels of radiant heat and ember attack on the proposed development.

The majority of on-site vegetation is proposed to be cleared to enable development of a significant urban built footprint amongst areas of landscaped/managed POS and interfacing roads to conservation areas. Therefore, for the purposes of strategic level planning to guide the amended Structure Plan process, Strategen-JBS&G does not consider the current on-site vegetation extent to be an unmanageable bushfire hazard issue since these hazards will be managed through a staged clearing process and ongoing fuel management that will be undertaken in and around individual development stages.

Based on the above information, Strategen-JBS&G considers that the bushfire hazards within and adjacent to the project area and the associated bushfire risk is readily manageable through standard management responses and compliance with acceptable solutions outlined in the Guidelines and AS 3959. These management measures will need to be factored in to subdivision design as early as possible to ensure a suitable, compliant and effective bushfire management outcome is achieved to ensure protection of future life and property assets.

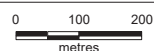
Demonstration of compliance with the relevant requirements of SPP 3.7, the Guidelines and AS 3959 at future planning stages will predominantly depend on Okeland Communities' ability to coordinate the timing and staging of clearing and development works within the project area in the aim of avoiding bushfire impacts from temporary vegetation.



Legend

- | | | | |
|--|----------------------|--|-----------------------|
| | Project area | | Hazard level |
| | 100m assessment area | | Extreme |
| | 150m assessment area | | Moderate |
| | Cadastral boundary | | Low |
| | POS | | Proposed road reserve |
| | Conservation area | | Roads (MRWA) |

Scale 1:12,000 at A4



Coord. Sys. GDA 1994 MGA Zone 50

Z

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**Kingsford Residential Estate,
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**POST-DEVELOPMENT
BUSHFIRE HAZARD LEVELS**

FIGURE 5



3. Bushfire management measures

This BMP has been prepared as a strategic guide to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. In this respect, Strategen-JBS&G has outlined a range of bushfire management measures that Okeland Communities will need to commit to implementing at future planning stages once an adequate level of detail is available to confirm the location and design of such measures.

Strategen-JBS&G considers that on implementation of the proposed management measures outlined in the following subsections, the project area will be able to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959.

3.1 Separation distances and fuel management

The post-development bushfire hazard levels depicted in Figure 5 demonstrate that all future habitable development within the site will, on completion, be located in areas subject to 'moderate' or 'low' bushfire hazard levels. In addition, future BMPs prepared to accompany the subdivision/development application stages will be required to demonstrate that all future habitable development will, on completion, be subject to a rating of BAL-29 or lower. This will be achieved through implementation of Asset Protection Zones (APZs), staging buffers and fuel management within on-site POS, as detailed in Sections 3.1.1, 3.1.2 and 3.1.3.

3.1.1 Asset Protection Zones (APZs)

APZs (or other forms of low threat separation) will be implemented at all interfaces where proposed development abuts classified vegetation to ensure future assets are afforded an appropriate level of low fuel defendable space and to prevent development in high risk areas such as Bushfire Attack Level (BAL)-40/FZ.

The width of APZs is required to provide sufficient separation distance for proposed development areas to achieve a BAL of BAL-29 or lower, which will meet compliance with acceptable solutions A1.1 and A2.1. The potential range of APZ widths relevant to the project area are provided in Table 1 and the final alignment and width of APZs will depend on the classification and effective slope of the interfacing vegetation.

Table 1: Potential range of APZ widths relevant to the project area

Vegetation class	Effective slope	Minimum APZ width to achieve BAL-29 or lower
Class A forest	Up-slope and flat land	21 m
	Down-slope >0-5 degrees	27 m
Class B woodland	Up-slope and flat land	14 m
	Down-slope >0-5 degrees	17 m
Class D scrub	Down-slope >0-5 degrees	15 m
Class C shrubland	Up-slope and flat land	9 m
Class G grassland	Up-slope and flat land	8 m
	Down-slope >0-5 degrees	9 m

The fuel load throughout the APZ is required to be maintained at less than 2 tonnes per hectare on a regular and ongoing basis (e.g. through regular slashing and weed control). Individual trees can be retained within the APZ; however, a minimum of 10 m separation between tree canopies is generally required. APZs are required to meet the criteria for low threat vegetation managed in a minimal fuel condition in accordance with Schedule 1 APZ standards of the Guidelines and Clause 2.2.3.2 (f) of AS 3959 and this can be achieved most effectively using one or a combination of the following:

- existing/proposed sealed roads and managed road verges (roads can be most effective for use within an APZ as they also provide public and emergency access at the vegetation interface)
- regularly managed/landscaped lawns, gardens or POS
- other sealed areas including driveways and car parks
- building setbacks.

No buildings are permitted within the APZ. Indicative alignment and width of APZs for this site will be determined once proposed lot layout is confirmed at the subdivision stage. This is to be documented in a brief addendum to this BMP or in a revised BMP to accompany future subdivision applications where appropriate. APZs/sufficient low threat separation are to be implemented around each stage of subdivision prior to the clearance of subdivision conditions and are to be wholly contained within the lot subject to the subdivision.

3.1.2 On-site staging buffers

Vegetation clearing will occur throughout the project area on a staged basis and in advance where necessary to ensure building construction is not inhibited by a temporary vegetation extent located on a future development stage that is yet to be cleared/managed. This can be achieved by ensuring each approved stage subject to construction is surrounded by a low threat staging buffer of sufficient width prior to building construction. Once the buffers are created, they will need to be maintained on a regular and ongoing basis at a fuel load less than 2 t/ha to achieve a low threat minimal fuel condition all year round until such time that the buffer area is developed as part of the next development stage. Where staging buffers cannot be wholly contained within the lot subject to the subdivision, APZs are to be implemented around each stage of subdivision prior to the clearance of subdivision conditions, and are to be wholly contained within the lot subject to the subdivision. This will manage the bushfire risk from on-site temporary vegetation during development staging. This measure will be confirmed following confirmation of proposed lot layout and development staging provisions and will be documented in a brief addendum to this BMP or a revised BMP to accompany future subdivision applications where appropriate.

3.1.3 Fuel management within on-site POS

As outlined in Section 2.4.2, clearing and fuel management within on-site POS will be undertaken to ensure these areas do not result in the introduction of bushfire hazards. The required works may include slashing of understorey grasses and weed control on a regular and ongoing basis to maintain fuel loads at less than 2 t/ha and achieve a low threat minimal fuel condition all year round.

Should any POS result in retention or introduction of bushfire hazards, then these areas may trigger application of AS3959 and require the provision of APZs and increased building construction standards for adjacent development areas. This is not considered to be a planning or compliance issue since adequate separation will be established between proposed development areas and each POS area.

A more detailed plan for on-site POS areas will be determined at the subdivision stage in concert with proposed lot layout. Any subsequent bushfire management measures that need to be implemented in response to the proposed POS concepts will be documented in a brief addendum to this BMP or a revised BMP to accompany future subdivision applications where appropriate.

3.2 BAL assessment and increased building construction standards

The majority of on-site vegetation, except for conservation POS, is proposed to be cleared to enable development of a significant urban built footprint. Therefore, the predominant BAL impact to future assets will be around the perimeter the project area and conservation POS areas. Measures will need to be put in place (such as those outlined in Section 3.1) to ensure all habitable development is avoided in areas of BAL-40/FZ so that a rating of BAL-29 or lower can be achieved with provision of a suitable APZs where required.

Once proposed lot layout is confirmed at the subdivision stage, as well as a suitable approach to manage the risk from adjacent bushfire hazard areas, a BAL contour map will need to be prepared to inform the indicative BAL impact over the site, as well as the necessary APZ separation requirements for proposed development areas. This process will inform those lots that require increased building construction standards.

The development design process will ensure a rating of BAL 29 or lower is achieved by incorporating the necessary APZs discussed in Section 3.1.1, which will meet the necessary acceptable solutions and performance criteria of Element 1 and Element 2 of the Guidelines. BAL contours and APZs will be depicted in a brief addendum to this BMP or a revised BMP to accompany future subdivision applications where appropriate.

3.3 Vehicular access

3.3.1 Public roads

The indicative public road network outlined in the amended Structure Plan is appropriate for the purposes of satisfying the intent of Element 3 of the Guidelines at this strategic planning stage in that multiple access routes to the surrounding public road network are proposed, no non-compliant dead-ends have been identified and suitable linkages are proposed with future development on adjacent landholdings.

Subsequently, members of the public and emergency services will be able to move safely throughout the development at all times. This will be confirmed as part of subdivision design whereby a minimum of two different vehicular access routes will be provided for all stages of development, both of which connect to the surrounding public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions. This will meet the criteria of acceptable solution A3.1. Additionally, two vehicular access routes are to be provided for each internal stage of subdivision prior to the clearance of subdivision conditions. Should temporary vehicular access to a second access route be required, particularly in the early stages of development, then compliant Emergency Access Ways (EAWs) will need to be considered to achieve this.

Strategen-JBS&G advises that cul-de-sacs, battle-axe blocks and private driveways longer than 50 m should be avoided as part of future subdivision design. Should any permanent cul-de-sacs be proposed, acceptable solution A3.3 will be met to ensure the cul-de-sacs are unavoidable, restricted to a maximum length of 200 m and the cul-de-sac head/s meet a minimum 17.5 m diameter. Should any battle-axe lots be proposed, acceptable solution A3.4 will be met to ensure battle-axe legs are unavoidable, are a maximum length of 600 m and a minimum width of 6 m. Should any private driveways longer than 50 m be proposed, acceptable solution A3.5 will be met to ensure compliance with requirements of the Guidelines.

Should any temporary EAWs be required, acceptable solutions A3.6 will be met to ensure compliance with requirements of the Guidelines. It is not anticipated that Fire Service Access Routes (FSARs) will be required as part of this development.

Firebreaks will not be required throughout the residential lot component of proposed development since these lots will be of a size that will not trigger firebreak requirements; however, firebreaks may be required for larger lots (such as conservation POS) in accordance with acceptable solution A3.8 and the City of Swan annual firebreak notice as amended (Appendix D).

Technical requirements for vehicular access components that may form part of proposed development will be met in accordance with Table 2. Vehicular access components of proposed development will be confirmed as part of subdivision design and demonstration of compliance with the relevant acceptable solutions for Element 3 of the Guidelines will be documented in a brief addendum to this BMP or revised BMP to accompany future subdivision applications where appropriate.

Table 2: Vehicular access technical requirements

Technical requirement	Public road	Cul-de-sac	Battle-axe legs and private driveways longer than 50 m	Emergency access ways	Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal distance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 m	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	8.5	8.5	8.5	8.5	8.5
* Refer to E3.2 Public roads: Trafficable surface					

3.4 Reticulated water supply

All proposed development areas will be provided a reticulated water supply through extension of adjacent services. The reticulated system will ensure an all year-round supply of water is provided for each lot to meet minimum domestic and emergency water supply requirements. This will thereby meet the intent of Element 4 of the Guidelines through compliance with acceptable solution A4.1.

A network of hydrants will also be provided along the internal road network at locations which meet relevant water supply authority and DFES requirements, in particular the Water Corporation Design Standard DS 63 'Water Reticulation Standard Design and Construction Requirements for Water Reticulation Systems up to DN250'. This standard will guide construction of the internal reticulated water supply system and fire hydrant network, including spacing and positioning of fire hydrants so that the maximum distance between a hydrant and the rear of a building envelope (or in the absence of a building envelope, the rear of the lot) shall be 120 m and the hydrants shall be no more than 200 m apart.

3.5 Additional measures

Strategen-JBS&G makes the following additional recommendations to inform ongoing development stages:

1. Notification on Title: notification on Title may be lodged on all lots with a rating of BAL-12.5 or higher (either through condition of subdivision or other head of power) to ensure all landowners/proponents and prospective purchasers are aware that their lot is currently in a designated bushfire prone area and that increased building construction standards may apply to future buildings as determined by future BAL contour mapping or BAL assessment. The notification on title is also to include that the site is subject to a Bushfire Management Plan.
2. BMP addendum or revised BMP: this BMP has been prepared at a strategic level to demonstrate development compliance will be met at future planning stages. Once further development detail is available, which is expected to be at the subdivision stage, a brief addendum to this BMP or revised BMP containing the necessary development and bushfire planning detail will need to be lodged with the subdivision application/s.
3. Compliance with current City of Swan annual firebreak notice: the developer/land manager and prospective land purchasers are to comply with the current City of Swan annual firebreak notice as outlined in Appendix 4 as amended.
4. Vulnerable land uses: Bushfire Emergency Evacuation Plans (BEEPs) will need to be prepared for any vulnerable land uses (such as primary schools, childcare facilities and aged care facilities) that are located in areas subject to BAL-12.5 to BAL-29 to address requirements of SPP 3.7 Policy Measure 6.6.1. This is to be completed at the development application or building permit stage once an adequate level of detail is available to inform such planning.
5. High risk land uses: Bushfire Risk Management Plans (BRMPs) will need to be prepared for any high risk land uses (such as service stations or land uses containing proposed storage of on-site flammable materials) that are located in areas subject to BAL-12.5 to BAL-29 to address requirements of SPP 3.7 Policy Measure 6.6.1. This is to be completed at the development application or building permit stage once an adequate level of detail is available to inform such planning.

4. Proposal compliance and justification

Proposed development within the project area is required to comply with SPP 3.7 under the following policy measures:

6.2 Strategic planning proposals, subdivision and development applications

- a)** Strategic planning proposals, subdivision and development applications within designated bushfire prone areas relating to land that has or will have a Bushfire Hazard Level (BHL) above low and/or where a Bushfire Attack Level (BAL) rating above BAL-LOW apply, are to comply with these policy measures.
- b)** Any strategic planning proposal, subdivision or development application in an area to which policy measure 6.2 a) applies, that has or will, on completion, have a moderate BHL and/or where BAL-12.5 to BAL-29 applies, may be considered for approval where it can be undertaken in accordance with policy measures 6.3, 6.4 or 6.5.
- c)** This policy also applies where an area is not yet designated as a bushfire prone area but is proposed to be developed in a way that introduces a bushfire hazard, as outlined in the Guidelines.

6.3 Information to accompany strategic planning proposals

Any strategic planning proposal to which policy measure 6.2 applies is to be accompanied by the following information prepared in accordance with the Guidelines:

- a) (i)** the results of a BHL assessment determining the applicable hazard level(s) across the subject land, in accordance with the methodology set out in the Guidelines. BHL assessments should be prepared by an accredited Bushfire Planning Practitioner; or
- a) (ii)** where the lot layout of the proposal is known, a BAL Contour Map to determine the indicative acceptable BAL ratings across the subject site, in accordance with the Guidelines. The BAL Contour Map should be prepared by an accredited Bushfire Planning Practitioner; and
- b)** the identification of any bushfire hazard issues arising from the relevant assessment; and
- c)** clear demonstration that compliance with the bushfire protection criteria in the Guidelines can be achieved in subsequent planning stages.

This information can be provided in the form of a Bushfire Management Plan or an amended Bushfire Management Plan where one has been previously endorsed.

Implementation of this BMP is expected to meet the following objectives of SPP 3.7:

- 5.1** Avoid any increase in the threat of bushfire to people, property and infrastructure. The preservation of life and the management of bushfire impact are paramount.
- 5.2** Reduce vulnerability to bushfire through the identification and consideration of bushfire risks in decision-making at all stages of the planning and development process.
- 5.3** Ensure that higher order strategic planning documents, strategic planning proposals, subdivision and development applications consider bushfire protection requirements and include specified bushfire protection measures.
- 5.4** Achieve an appropriate balance between bushfire risk management measures and, biodiversity conservation values, environmental protection and biodiversity management and landscape amenity, with consideration of the potential impacts of climate change.

In response to the above requirements of SPP 3.7, the bushfire management measures, as outlined in Section 3, have been devised for the proposed development in accordance with acceptable solutions of the Guidelines to meet compliance with bushfire protection criteria. An 'acceptable solutions' assessment is provided in Table 3 to assess the proposed bushfire management measures against each bushfire protection criteria in accordance with the Guidelines and demonstrate that the measures proposed meet the intent of each element of the bushfire protection criteria.

Table 3: Acceptable solutions assessment against bushfire protection criteria

Bushfire protection criteria	Intent	Acceptable solutions	Proposed bushfire management measures	Compliance statement
Element 1: Location	To ensure that strategic planning proposals, subdivision and development applications are located in areas with the least possible risk of bushfire to facilitate the protection of people, property and infrastructure	A1.1 Development location The strategic planning proposal, subdivision and development application is located in an area that is or will, on completion, be subject to either a moderate or low bushfire hazard level, or BAL-29 or below.	Refer to Sections 3.1 and 3.2, which demonstrate that development will only occur in areas of BAL-29 or lower. No development will occur in BAL-FZ or BAL-40 areas. Refer to Sections 2.3 and 2.4, which demonstrate that development will be located within areas of low or moderate bushfire hazard. This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	The measures proposed are considered to comply and meet the intent of Element 1 Location.
Element 2: Siting and design of development	To ensure that the siting and design of development minimises the level of bushfire impact	A2.1 Asset Protection Zone Every building is surrounded by an APZ, depicted on submitted plans, which meets detailed requirements (refer to the Guidelines for detailed APZ requirements).	Refer to Section 3.1, which demonstrates that minimum width APZs (or other sufficient separation) will be provided at all development-vegetation interfaces. This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	The measures proposed are considered to comply and meet the intent of Element 2 Siting and design of development
Element 3: Vehicular access	To ensure that the vehicular access serving a subdivision/development is available and safe during a bushfire event	A3.1 Two access routes Two different vehicular access routes are provided, both of which connect to the public road network, provide safe access and egress to two different destinations and are available to all residents/the public at all times and under all weather conditions.	Refer to Section 3.3, which demonstrates that a minimum of two different vehicular access routes will be provided for the proposed development at all times via the internal road network. This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	The measures proposed are considered to comply and meet the intent of Element 3 Vehicular access

		A3.2 Public road A public road is to meet the requirements in Table 4 Column 1 of the Guidelines.	Refer to Section 3.3, which demonstrates that all proposed public roads will meet requirements of the Guidelines (refer to Table 2). This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	
		A3.3 Cul-de-sac (including a dead-end-road) A cul-de-sac and/or a dead-end road should be avoided in bushfire prone areas. Where no alternative exists (i.e. the lot layout already exists and/or will need to be demonstrated by the proponent), detailed requirements will need to be achieved as per Table 4 Column 2 of the Guidelines.	Refer to Section 3.3, which demonstrates that cul-de-sacs will be avoided where possible as part of subdivision design. If unavoidable, cul-de-sacs will comply with technical requirements of the Guidelines (refer to Table 2). This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	
		A3.4 Battle-axe Battle-axe access legs should be avoided in bushfire prone areas. Where no alternative exists, (this will need to be demonstrated by the proponent) detailed requirements will need to be achieved as per Table 4 Column 3 of the Guidelines.	Refer to Section 3.3, which demonstrates that battle-axe legs will be avoided where possible as part of subdivision design. If unavoidable, battle-axe legs will comply with technical requirements of the Guidelines (refer to Table 2). This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	
		A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements as per Table 4 Column 3 of the Guidelines.	Refer to Section 3.3, which demonstrates that any private driveways longer than 50 m will meet requirements of the Guidelines (refer to Table 2). This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	

		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 detailed requirements as per Table 4 Column 4 of the Guidelines.	Refer to Section 3.3, which demonstrates that any temporary EAWs will meet requirements of the Guidelines (refer to Table 2). This will be further confirmed as part of a BMP addendum to accompany future subdivision applications where appropriate.	
		A3.7 Fire service access routes (perimeter roads) Fire service access routes are to be established to provide access within and around the edge of the subdivision and related development to provide direct access to bushfire prone areas for fire fighters and link between public road networks for firefighting purposes. Fire service access routes are to meet detailed requirements as per Table 4 Column 5 of the Guidelines.	N/A It is not anticipated that FSARs will be required as part of development.	
		A3.8 Firebreak width Lots greater than 0.5 hectares must have an internal perimeter firebreak of a minimum width of three metres or to the level as prescribed in the local firebreak notice issued by the local government	Refer to Section 3.3, which demonstrates that no firebreaks will be required for individual residential lots. However, should any firebreaks be required for larger lots (such as POS) these will meet requirements of the Guidelines and the City of Swan annual firebreak notice. This will be further confirmed as part of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate.	

Element 4: Water	To ensure that water is available to the subdivision, development or land use to enable people, property and infrastructure to be defended from bushfire.	A4.1 Reticulated areas The subdivision, development or land use is provided with a reticulated water supply in accordance with the specifications of the relevant water supply authority and Department of Fire and Emergency Services.	Refer to Section 3.4, which demonstrates that all proposed lots will be provided a reticulated water supply and network of hydrants in accordance with local water authority, City and DFES requirements.	The measures proposed are considered to comply and meet the intent of Element 4 Water
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5. Implementation, enforcement and review

This BMP has been prepared at a strategic level to demonstrate how development compliance will be delivered at future planning stages in accordance with the Guidelines. In this respect, the management measures documented in Section 3, where applicable, will be incorporated into development design as early as possible and confirmed at the subdivision stage. Therefore, aside from preparation of a BMP addendum or revised BMP to accompany future subdivision applications where appropriate, there are no further items to implement, enforce or review at this stage of the planning process. Any BMP addendum/s or revised BMPs prepared to accompany future subdivision application/s will need to meet the relevant commitments outlined in this strategic level BMP, address the relevant requirements of SPP 3.7 (i.e. Policy Measure 6.4) and demonstrate in detail how the proposed development will incorporate the relevant acceptable solutions to meet the performance requirements of the Guidelines. The BMP addendum/s will be required to include the following detailed information:

- proposed lot layout
- post development vegetation classifications, effective slope and separation distances
- post development BAL application requirements through preparation of a BAL contour map demonstrating that proposed development areas will achieve a rating of BAL-29 or lower
- width and alignment of compliant APZs (or other sufficient separation)
- confirmation of how bushfire management will be addressed during development staging and any specific staging measures (i.e. low threat buffers, temporary EAWs, etc)
- confirmation of how bushfire management will be addressed with regards to bushfire hazards on adjacent landholdings
- fuel management or AS 3959 application in response to on-site POS (if and where required)
- vehicular access provisions, including demonstration that a minimum of two access routes will be achieved for each stage of subdivision in accordance with acceptable solution A3.1
- water supply provisions with regards to reticulated water
- future requirements for any identified vulnerable land uses, such as provision of a Bushfire Emergency Evacuation Plan at the development application or building permit stage
- future requirements for any identified high risk land uses, such as provision of a Bushfire Risk Management Plan at the development application or building permit stage
- provisions for Notification on Title as a subdivision condition
- compliance requirements with the current City of Swan annual firebreak notice
- acceptable solutions assessment against the bushfire protection criteria
- proposed works program outlining all measures requiring implementation and the appropriate timing and responsibilities for implementation.

Based on the information contained in this BMP, Strategen-JBS&G considers the bushfire hazards within and adjacent to the project area and the associated bushfire risks are readily manageable through standard acceptable solutions outlined in the Guidelines. Strategen-JBS&G considers that on implementation of the proposed management measures, the project area will be able to be developed with a manageable level of bushfire risk whilst maintaining full compliance with the Guidelines and AS 3959.

6. Limitations

Scope of services

This report ("the report") has been prepared by Strategen-JBS&G in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Strategen-JBS&G. In some circumstances, a range of factors such as time, budget, access and/or site disturbance constraints may have limited the scope of services. This report is strictly limited to the matters stated in it and is not to be read as extending, by implication, to any other matter in connection with the matters addressed in it.

Reliance on data

In preparing the report, Strategen-JBS&G has relied upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise expressly stated in the report, Strategen-JBS&G has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. Strategen-JBS&G has also not attempted to determine whether any material matter has been omitted from the data. Strategen-JBS&G will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to Strategen-JBS&G. The making of any assumption does not imply that Strategen-JBS&G has made any enquiry to verify the correctness of that assumption.

The report is based on conditions encountered and information received at the time of preparation of this report or the time that site investigations were carried out. Strategen-JBS&G disclaims responsibility for any changes that may have occurred after this time. This report and any legal issues arising from it are governed by and construed in accordance with the law of Western Australia as at the date of this report.

Environmental conclusions

Within the limitations imposed by the scope of services, the preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted environmental consulting practices. No other warranty, whether express or implied, is made.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

Strategen-JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by Strategen-JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

7. References

- Department of Fire and Emergency Services (DFES) 2019, *Map of Bush Fire Prone Areas*, [Online], Government of Western Australia, available from: <http://www.dfes.wa.gov.au/regulationandcompliance/bushfireproneareas/Pages/default.aspx>, [Accessed: 13/09/2021].
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- Commonwealth Science and Industrial Research Organisation (CSIRO) 1999, *Fire Danger and Fire Spread Calculator*, Commonwealth Science and Industrial Research Organisation, Perth.
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- McCaw L and Hanstrum B 2003, 'Fire environment of Mediterranean south-west Western Australia', in *Fire in Ecosystems of South-West Western Australia: Impacts and Management*, eds I Abbott & ND Burrows, Backhuys Publishers, Leiden, Netherlands, pp. 171–188.
- Standards Australia (SA) 2018, *Australian Standard AS 3959–2018 Construction of Buildings in Bushfire-prone Areas*, Standards Australia, Sydney.
- Western Australian Planning Commission (WAPC) 2015, *State Planning Policy 3.7 Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.
- Western Australian Planning Commission (WAPC) 2017, *Guidelines for Planning in Bushfire-Prone Areas*, Western Australian Planning Commission, Perth.

Appendix A Georeferenced site photographs



Photo 1: Class B woodland to the south of the project area



Photo 2: Class B woodland to the east of the project area

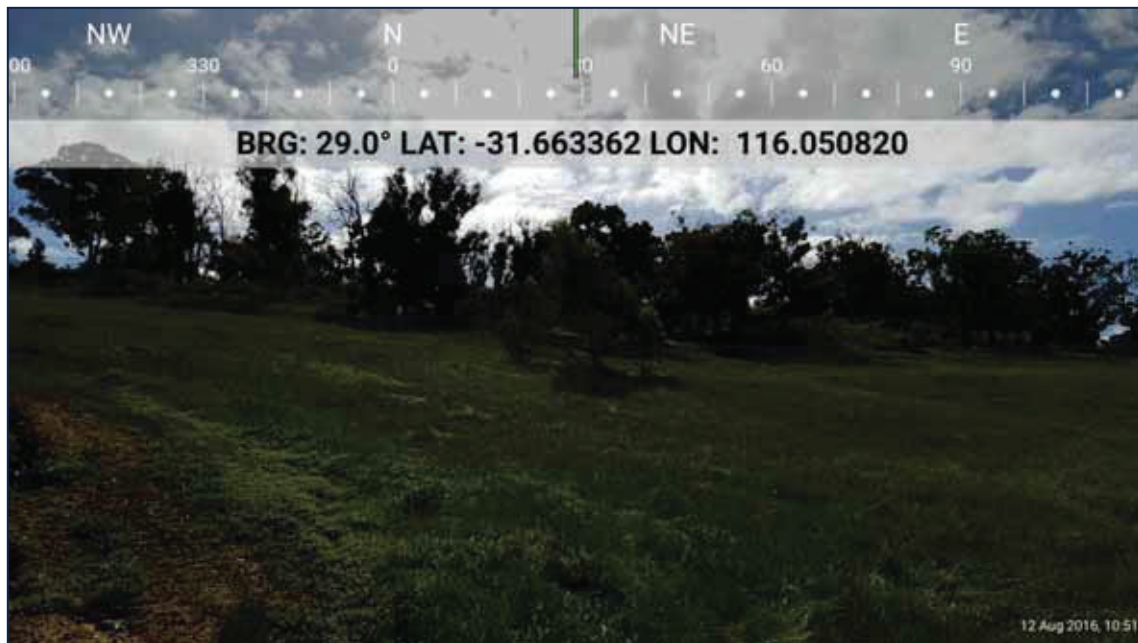


Photo 3: Class B Woodland to the northeast of the project area



Photo 4: Class G grassland to the south of the project area



Photo 5: Class G grassland to the east of the project area (Class B woodland in background)



Photo 6: Non-vegetated area excluded under Clause 2.2.3.2 (e) to the east of the project area



Photo 7: Non-vegetated areas and low threat managed vegetation excluded under Clauses 2.2.3.2 (e) and (f) to the west of the project area



Photo 8: Class B woodland within the project area



Photo 9: Class B woodland within proposed conservation POS in the west of the project area



Photo 10: Class C shrubland (foreground) to the west of the project area

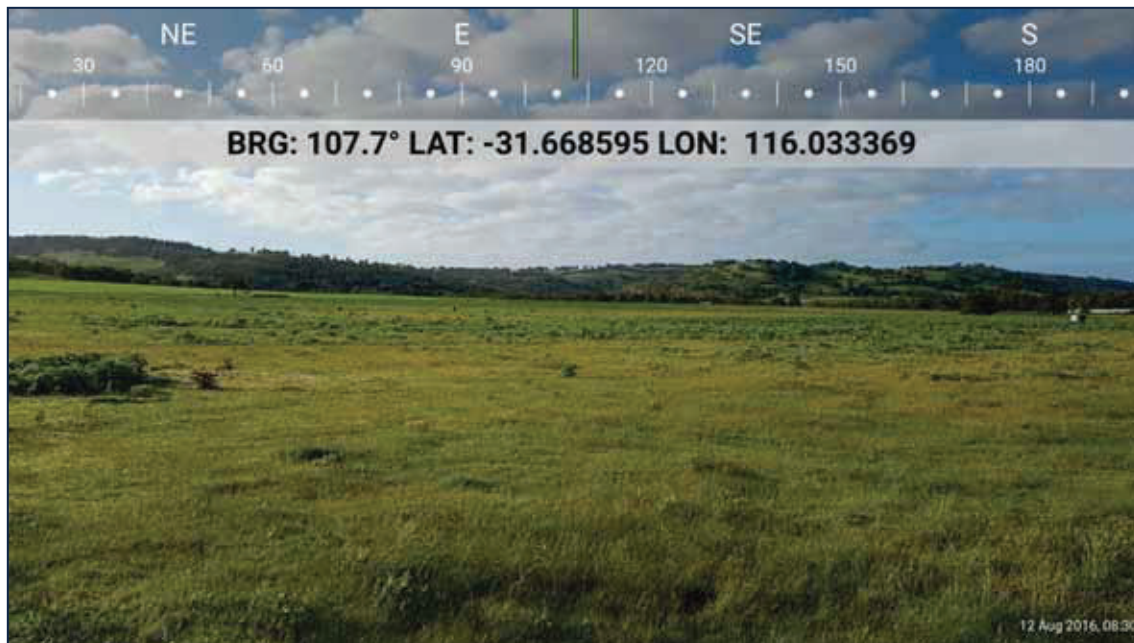


Photo 11: Class G grassland in the southwest of the project area



Photo 12: Class G grassland vegetation in the northwest of the project area



Photo 13: Non-vegetated areas and low threat managed vegetation excluded under Clauses 2.2.3.2 (e) and (f) to the north of the project area



Photo 14: Non-vegetated areas and low threat managed vegetation excluded under Clauses 2.2.3.2 (e) and (f) to the northwest of the project area

Appendix B Summer wind profiles for Pearce RAAF weather station

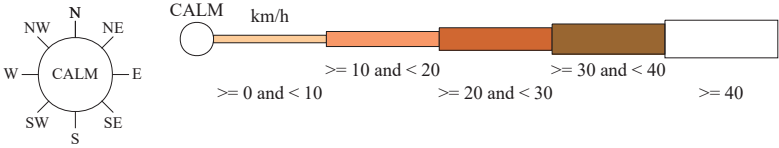
Rose of Wind direction versus Wind speed in km/h (02 Nov 1940 to 31 Oct 2011)

Custom times selected, refer to attached note for details

PEARCE RAAF

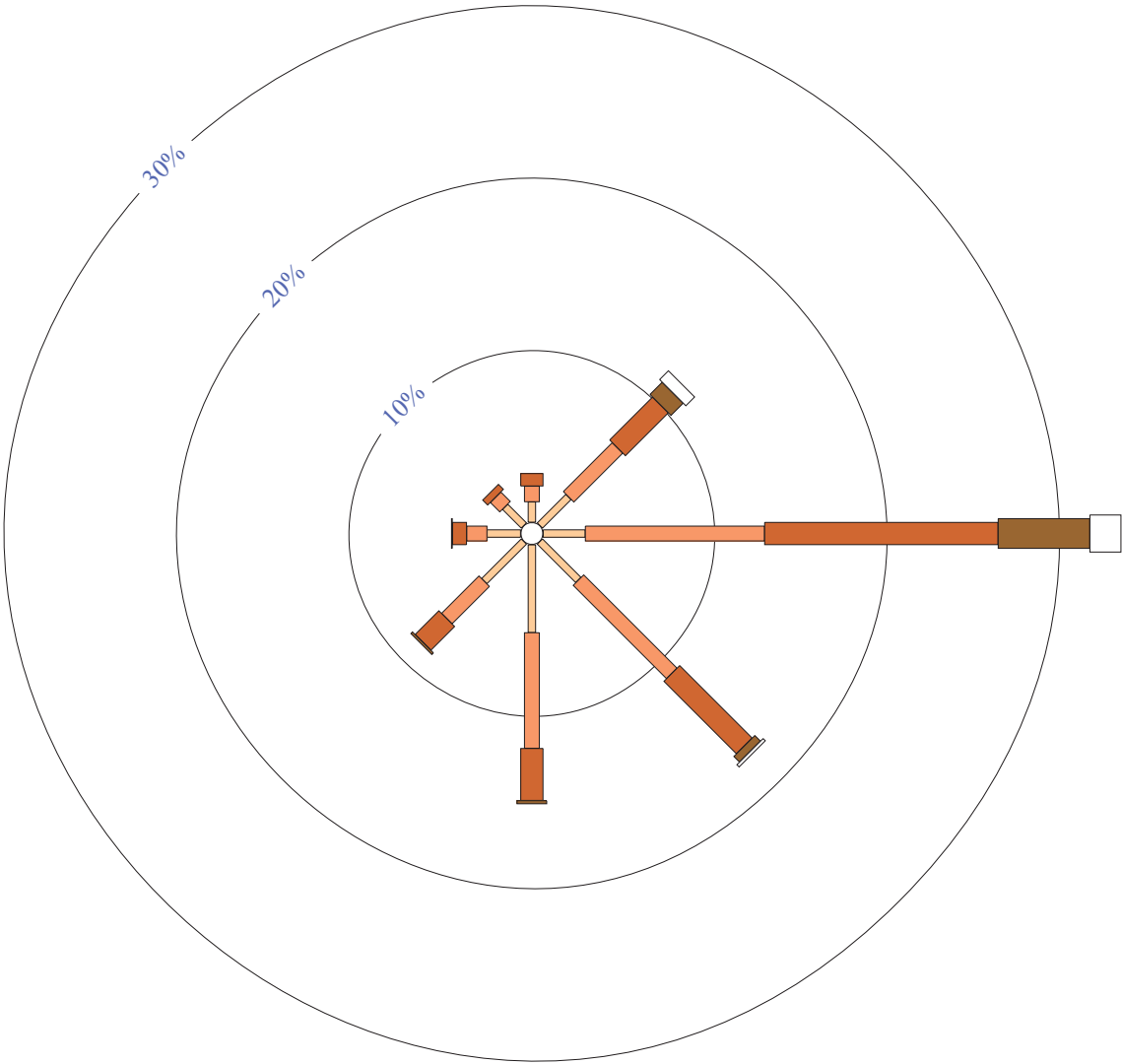
Site No: 009053 • Opened Jan 1937 • Still Open • Latitude: -31.6669° • Longitude: 116.0189° • Elevation 40m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



9 am Jan
1093 Total Observations

Calm 3%



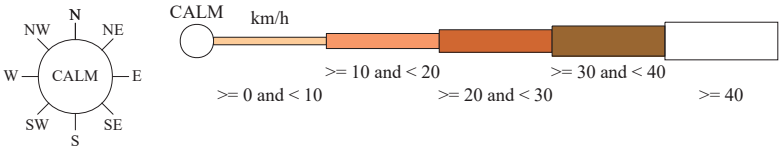
Rose of Wind direction versus Wind speed in km/h (02 Nov 1940 to 31 Oct 2011)

Custom times selected, refer to attached note for details

PEARCE RAAF

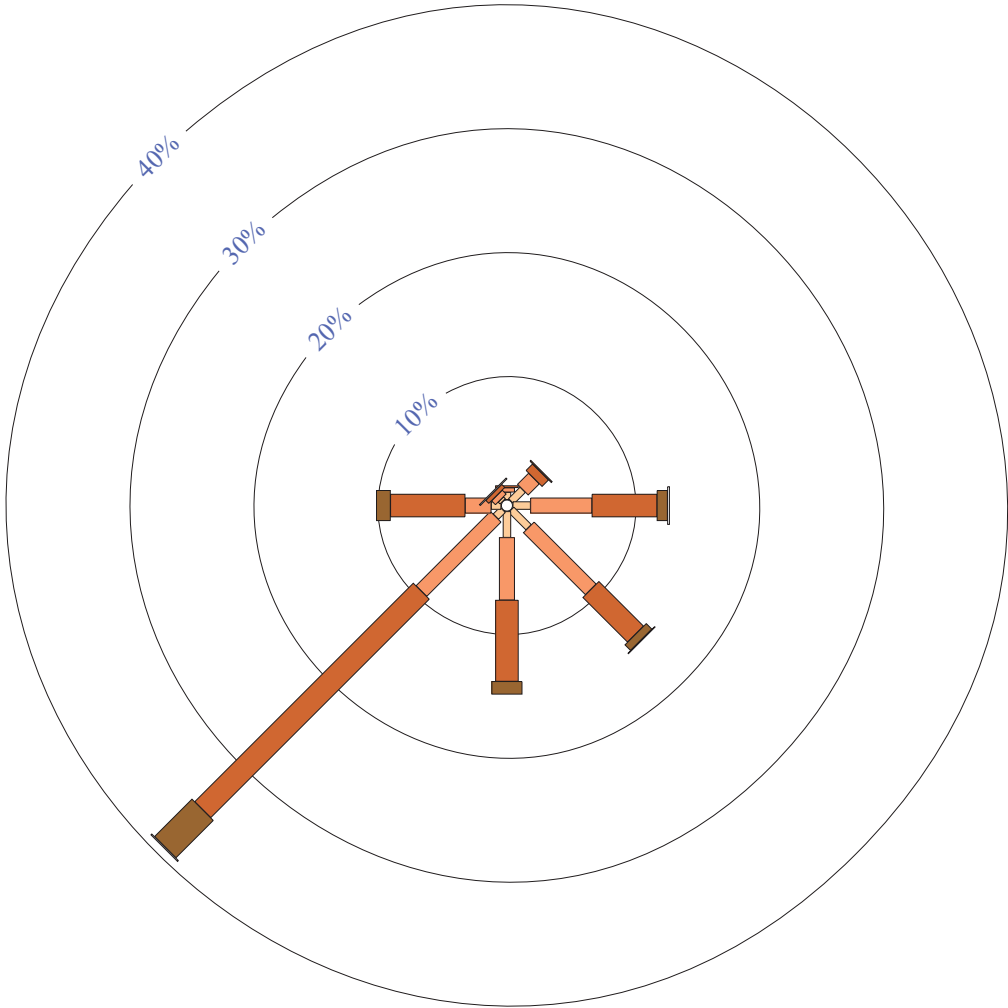
Site No: 009053 • Opened Jan 1937 • Still Open • Latitude: -31.6669° • Longitude: 116.0189° • Elevation 40m

An asterisk (*) indicates that calm is less than 0.5%.
Other important info about this analysis is available in the accompanying notes.



3 pm Jan
1015 Total Observations

Calm 2%



Appendix C Landscape Masterplan (Emerge 2019)

4. APPENDIX A LANDSCAPE MASTERPLAN



LEGEND

Site Boundary

POS

Indicative 1:1 ARI Drainage

Existing Dam

Existing Vegetation



Neighbourhood POS/Recreation nodes (high order)



Neighbourhood POS/Recreation nodes (low order)



Entry Statements



Green Streets



Town Centre

400m Ped Shed

800m Ped Shed

Appendix D City of Swan Fire Hazard Reduction Notice (as amended)

Bush Fires Act 1954

City of Swan

Fire Hazard Reduction Notice (Firebreak Notice)

Notice to Owners and/or Occupiers of land situated within the City of Swan.

To assist in the control of bush fires, and pursuant to Section 33 of the Bush Fires Act 1954, all owners and occupiers of land within the City of Swan are required on or before the 1st day of November, 2020, or within 14 days of becoming an owner or occupier of land after that date, must meet the fire hazard reduction conditions described in this notice and maintain these conditions up to and including the 30th day of April, 2021.

1. All land up to 5,000m² (0.5 Hectares or 1.2 Acres)

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Maintain all grass to a height of no greater than 10cm.
- 3) Areas of natural vegetation to be maintained at or below 8 tonnes per hectare.
- 4) Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

2. All land between 5,000m² and 25,000m² (0.5 - 2.5 Hectares) or (1.2 - 6.2 Acres)

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Install firebreaks immediately inside and adjacent to all external property boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details).
- 3) Maintain all grass to a height of no greater than 10cm.
 - a) If the land is stocked, the grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- 4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.
- 5) Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

3. All land with an area greater than 25,000m² (2.5 Hectares or 6.2 Acres)

- 1) Install and maintain an asset protection zone in accordance with the requirements specified in clause 13 of this notice.
- 2) Install firebreaks immediately inside and adjacent to all external property boundaries. Firebreaks need to be 3 metres wide with a 4 metre vertical height clearance free from flammable materials and overhanging branches (see section 10 in this notice for further details).
 - a) Properties over 100 hectares require additional firebreaks to divide the land into areas not exceeding 100 hectares.
- 3) Slash or mow grass to a height no greater than 10cm immediately adjacent to firebreaks to a minimum width of 3 metres.
 - a) If the land is stocked, this grass must be reduced and maintained to a height of no greater than 10cm by the 1st day of December.
- 4) Natural vegetation within 100 metres of buildings including attached and adjacent structures and essential infrastructure shall be maintained at or below 8 tonnes per hectare, by passive methods of fuel reduction that does not permanently remove or reduce the quantity or occurrence of the native plants, shrubs and trees within the subject area.
- 5) Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

4. Plantations

- 1) Install and maintain external and internal firebreaks, firebreaks that form compartments (cells), firebreaks and hazard reduction measures that protect neighbouring communities and essential infrastructure in accordance with the requirements of a fire management plan approved in writing by the City; or
- 2) Where no such approved fire management plan exists,
 - a) Unless the City approves an alternative plan in writing in accordance with clause 4(2)(b), install and maintain external and internal firebreaks and firebreaks that form compartments (cells), and carry out all other firebreaks and hazard reduction measures which are required in accordance with the requirements and specifications within the Department of Fire & Emergency Services 'Guidelines for Plantation Fire Protection' 2011 publication; or
 - b) If it is considered impractical for any reason to carry out the plantation requirements outlined above in clause 4 (2)(a), plantation owners and managers may apply in writing to the City to implement an alternative plan or measures in accordance with clause 4 of this notice. A Fire Management Plan may be required to be developed and submitted as part of the application.

5. Application to Vary Firebreak and Hazard Reduction Requirements

- 1) If it is considered impractical for any reason to clear firebreaks in a manner or location required by this notice, or to carry any fire hazard reduction work or measures required by this notice, you may apply in writing on or before the 15th day of October, for approval to provide firebreaks in alternative positions or to take alternative measures to abate fire hazards on the land. Alternative firebreak application forms can be downloaded from the City of Swan website.
- 2) If permission is not granted in writing by the City prior to the 1st day of November, you shall comply with the requirements of this notice.
- 3) When permission for alternative firebreaks or fire hazard reduction measures has been granted, you shall comply with all conditions on the endorsed permit and maintain the land to the required standard throughout the period specified by this notice.
 - a) Where a property is affected by an approved bushfire management plan, property owners must comply with any additional requirements and responsibilities outlined within that plan.

6. Fuel Dumps and Depots

Remove all flammable material within 10 metres of fuel dumps, fuel ramps or where fuel drums, whether containing fuel or not, are stored.

7. Hay Stacks

Clear and maintain a firebreak completely surrounding any haystack on the land, within 60 metres of the haystack.

8. Fire Service Access (Strategic Firebreaks)

- 1) Where under a written agreement with the City, or where depicted on an approved bushfire management plan Fire Service Access (Strategic Firebreaks) are required on the land, you are required to clear and maintain the Fire Service Access (Strategic Firebreaks) a minimum of 6 metres wide along the agreed alignment to provide restricted vehicular access to emergency services and authorised vehicles.
- 2) Fire Service Access (Strategic Firebreaks) must be free from flammable material and unimpeded by obstructions including boundary fences and gates unless approved in writing by the City.
- 3) Gates may only be secured with City of Swan Fire Service padlock.
- 4) Fire Service Access (Strategic Firebreaks) shall be graded to provide a continuous 4 wheel drive trafficable surface a minimum of 4 metres wide with a 1 metre shoulder on either side.
- 5) All branches must be pruned and obstacles removed to maintain a 4 metre vertical height clearance above the full 6 metre width of the trafficable surface.

9. Emergency Access Ways

- 1) Where under a written agreement with the City, or where depicted on an approved bushfire management plan, Emergency Access Ways are required on private land, you are required to clear and maintain a vehicular access way to a minimum of 6 metres wide along the agreed alignment.
- 2) Emergency access ways must be free from flammable material and unimpeded by obstructions including boundary fences and gates unless approved in writing by the City.
- 3) Gates on Emergency Access Ways must remain unlocked at all times.
- 4) Emergency Access Ways shall be graded and have suitable drainage to provide a minimum 6 metre wide continuous trafficable surface suitable for all types of 2 wheel drive vehicles.

- 5) All branches must be pruned and obstacles removed to maintain a 4 metre vertical height clearance above the full 6 metre width of the trafficable surface.

10. Firebreak Construction

- 1) Firebreaks are to be developed and maintained clear of all obstacles and flammable materials to create a minimum of 3 metres wide trafficable surface suitable for 4 wheel drive vehicles.
- 2) Overhanging branches must be pruned to provide a 4 metre vertical clearance above the full width of the firebreak surface.
- 3) Boundary firebreaks must be aligned immediately inside and adjacent to the external property boundaries.
- 4) Alternative Firebreaks that are approved in writing by the City, or as depicted within a bushfire management plan approved in writing by the City, are to be constructed to the same standard as general firebreaks and must be constructed along the specified alignment.
- 5) Firebreaks must not terminate in a dead end.
- 6) Firebreaks may be constructed by ploughing, grading, raking, burning, chemical spraying or any other approved method that achieves the required standard.

11. Driveways

Where building sites are situated more than 50 metres from a public road,

- 1) Driveways must be maintained clear of all permanent obstacles and flammable materials to create a minimum 3 metre wide trafficable surface suitable for all types of 2 wheel drive vehicles.
- 2) Overhanging branches must be pruned to provide a 4 metre vertical clearance above the driveway.

12. Fuel Reduction – Natural Vegetation

- 1) Available bushfire fuels must be maintained at or below:
 - a) Asset Protection Zones - 2 tonnes per hectare
 - b) Hazard Separation Zones - 8 tonnes per hectare

*This requirement only applies where HSZs are depicted within a Fire Management Plan approved in writing by the City.

 - c) Natural Vegetation - 8 tonnes per hectare for areas of natural vegetation within 100 metres of buildings, attached and adjacent structures and essential infrastructure
- 2) Passive Fuel Reduction within natural vegetation may be achieved by burning, raking, pruning, weed management, removal of dead materials and any other approved method.
- 3) Permanent removal or partial clearing of natural vegetation including individual or groups of native grasses, shrubs or trees may only be carried out to meet the minimum requirements of this notice.
- 4) Permanent clearing of natural vegetation structures including individual plants, shrubs or trees, that exceeds the requirements of this notice or the specifications outlined within a bushfire management plan approved in writing by the City, is only permitted in accordance with the provisions and exemptions outlined within the Environmental Protection Act 1986, or with the approval of the Department of Water and Environmental Regulation and the City of Swan.

Note: Advice and resources on how to measure and manage native vegetation fuel loads are available from the Department of Fire and Emergency Services or the City of Swan.

13. Asset Protection Zones Specification

Asset protection zones for habitable buildings and other assets must meet the following requirements:

- 1) Extend 20 metres out from any external walls of the building, attached structures, or adjacent structures within 6 metres of the habitable building, unless varied under an approved bushfire management plan.
- 2) On sloping ground the asset protection zone distance shall increase with 1 metre for every degree in slope on the sides of the building/ structure that are exposed to down slope natural vegetation.
- 3) Asset protection zone requirements only apply within the boundaries of the lot on which the asset is located and cannot be enforced across boundaries.
- 4) Recommendation Only - Asset protection zones predominantly consist of non-flammable managed vegetation, reticulated lawns and gardens and other non-flammable features.
- 5) All grass is maintained to or under 10cm.
- 6) Fuel loads must be reduced and maintained at 2 tonnes per hectare or lower.
- 7) The crowns of trees are to be separated where possible to create a clear separation distance between adjoining or nearby tree crowns. The separation distance between tree crowns is not required to exceed 10 metres. Clearing or thinning existing trees to create distances greater than 10 metres separation between tree crowns within an asset protection zone is not required or supported by this notice and requires approval from the Department of Water and Environmental Regulation and the City of Swan.

- 8) A small group of trees within close proximity to one another may be treated as one crown provided the combined crowns do not exceed the area of a large or mature crown size for that species.
- 9) Trees are to be low pruned (or under pruned) to at least a height of 2 metres from ground.
- 10) No tree, or shrub over 2 metres high is planted within 2 metres of a building, especially adjacent to windows.
- 11) There are no tree crowns or branches hanging over buildings.
- 12) Clear and prune scrub to reduce to a sparse density (able to walk through vegetation with relative ease with minimal deviation around trees and shrubs).
- 13) Install paths or clear flammable or dry vegetation, debris and materials immediately adjacent to the building.
- 14) Wood piles and flammable materials stored a safe distance from buildings.

14. Burning

All burning must be carried out in accordance with the relevant provisions of this notice and the Bush Fires Act 1954, Health Act 1911 and the City's Consolidated Local Laws 2005.

Prohibited Period: All burning, including garden refuse and camping fires are prohibited.

Restricted Period: All burning requires a permit except for the burning of garden refuse and camping fires which are subject to the following conditions:

- 1) The fire must not be lit if the Fire Danger Rating is Very High or above, or if a Total Fire Ban or a Harvest and Vehicle Movement Ban is declared.
- 2) Only one fire is allowed at any time and it does not exceed 1 cubic metre in size.
- 3) No flammable material within 5 m of the fire.
- 4) The fire is only lit between 6 pm and 11 pm and completely extinguished by midnight.
- 5) At least one person capable of controlling the fire is in attendance at all times with adequate means of extinguishing the fire.

15. Cooking Fires

Fires for the purpose of cooking are exempt from burning period restrictions subject to the following conditions:

- 1) The fire must not be lit if the Fire Danger Rating is Very High or above, or if a Total Fire Ban or a Harvest and Vehicle Movement Ban is declared.
- 2) The fire is contained in a purpose built appliance and
 - a) at a person's home; or
 - b) an area is set aside for that purpose by the State Authority or City of Swan
- 3) No flammable material within 5 m of the fire.
- 4) At least one person capable of controlling the fire is in attendance at all times with adequate means of extinguishing the fire.

16. Compliance

- 1) In addition to the requirements of this notice, further works which are considered necessary by an Authorised Officer of the City may be required as specified in writing in a subsequent notice addressed to the land owner.
- 2) Where the owner or occupier of the land fails or neglects to comply with the requirements of this notice or a subsequent notice addressed to the land owner, the City of Swan may enter onto the land with workmen, contractors, vehicles and machinery to carry out the requisitions of the notice at the expense of the land owner.
- 3) Failure to comply with this notice and subsequent written notices may result in a penalty not exceeding \$5,000, or the issue of a \$250 infringement notice and liability for any costs incurred by the City in relation to works undertaken on behalf of the land owner
- 4) Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in this notice and with any additional requirements outlined within that plan.

17. Definitions

'Alternative Firebreak' is a firebreak that is in an alternative position or alignment to the external boundaries of a property.

'Alternative Firebreak Application' is an application that may be made by a land owner to install firebreaks in an alternative position, or to carry out alternative measures in lieu of general firebreaks.

'Available Fuel' is the bush fuel consisting of live and dead vegetation such as stubble, mulch, leaf litter, twigs, trash, scrub and other vegetation less than 6mm in diameter capable of carrying a running fire and will actually burn under prevailing conditions.

'City' means the City of Swan.

'Buildings, Attached and Adjacent Structures' means habitable buildings that are used as a dwelling, workplace, place of gathering or assembly, a building that is a car park, or a building used for the storage

or display of goods or produce for sale by whole sale in accordance with classes 1-9 of the Building Code of Australia. The term building includes attached and adjacent structures like garages, carports verandas or similar roofed structure(s) that are attached to, or within 6 metres of the dwelling or primary building.

'Asset Protection Zone (APZ)' is a low fuel area that is reduced of flammable vegetation and materials surrounding buildings and essential infrastructure to minimise the likelihood and impact that direct flame contact, radiant heat or ember attack may have on buildings and assets in the event of a bushfire. This area must extend out from the external walls of a building or asset a minimum of 20 metres.

'Bushfire Management Plan' or 'Fire Management Plan' is a comprehensive plan that may be placed on the certificate of title(s) of land that has been developed as a condition of development or subdivision. Bushfire Management Plans may become out dated and it's the responsibility of the property owner to review and keep them current. Where a property is affected by an approved bushfire management plan, property owners must still comply with all requirements in the Annual Fire Hazard Reduction Notice and with any additional requirements outlined within that plan.

'Emergency Access Way' is a two wheel drive trafficable, 6 metre wide access route to provide local residents, general public and emergency services alternative links to road networks at the end of cul- de-sacs or areas where access is limited during an emergency incident.

'Essential Infrastructure' or **'Critical Infrastructure'** means assets, infrastructure, systems and networks that provide essential services necessary for social and economic wellbeing and is typically public infrastructure. Assets and infrastructure, usually of a public nature, that generate or distribute electricity, water supply, telecommunications, gas and dams are typical assets that are essential to society and are often located in, or traverse areas that are prone to bushfires.

'Firebreak' is an area of land cleared of flammable material (see available fuel above) to minimise the spread of a bushfire and to provide access for firefighting services. For the purpose of this notice the term firebreak is a strip of land at minimum 3 metres with a 4 metres vertical clearance, constructed to provide a 4 wheel drive trafficable surface for access by emergency and authorised vehicles. Boundary firebreaks are installed immediately adjacent the external boundaries of a property.

'Fire Hazard' means accumulated fuel (living or dead) such as leaf litter, twigs, trash, bush, dead trees and scrub capable of carrying a running fire, but excludes standing living trees and isolated shrubs.

'Hazard Separation Zone (HSZ)' means an area extending out from an asset protection zone a distance of 80 metres unless otherwise specified, to create a graduated fuel reduction and separation from natural vegetation.

'Natural Vegetation' means natural areas of forest, woodland, shrubland, scrub, mallee or mulga.

'Passive Fuel Reduction' means lowering the amount of available fuel that will burn under prevailing conditions by means that will not permanently reduce or modify the structure or life cycle of plant, shrub, scrub or tree communities within an treated area. This is typically achieved by undertaking a cool, controlled burn of an area during cooler, damper months, or by physical removal of built up leaf litter, dead materials, weeds and slashing long dry grasses without damaging live native plants within the area.

'Plantation' is any area of native or exotic planted trees that exceeds three hectares in a gazetted town site, or elsewhere a stand of trees of 10 hectares or larger that has been planted and managed intensively for their commercial and environmental value. A plantation includes roads, firebreaks and small areas of native vegetation.

'Fire Service Access (Strategic Firebreaks)' is a firebreak that is 6 metres wide established to provide strategic access and links to road networks whilst providing a wider control/ containment line to protect town sites, estates and similar exposures during bushfire operations.

By order of the Council,

MJ Foley

Chief Executive Officer

City of Swan

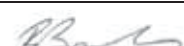
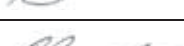
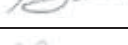
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Rev B	P Molinari (BPAD39183)	R Banks (BPAD36857)	R Banks		7/07/2017
Rev 0	P Molinari (BPAD39183)	R Banks (BPAD36857)	R Banks		18/07/2017
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Rev 5	Z Cockerill (BPAD37803)	Z Cockerill (BPAD37803)	Z Cockerill		13/09/2021

Appendix 2

Acoustic Assessment

(Herring Storer)

Our ref: 23619-1-16264-03

10 January 2019

Roberts Day
Level 2
442 Murray Street
PERTH WA 6000

Attention: Andrew Brodie
Address: Andrew.Brodie@robertsday.com.au

Dear Andrew,

**RESIDENTIAL DEVELOPMENT – LOT 1354 GREAT NORTHERN HIGHWAY, BULLSBROOK STAGES 1, 2, 5 & 7
REVIEW OF SPP 5.4 ACOUSTIC REQUIREMENTS**

As requested, we provide the following information regarding the acoustic requirements for the above stages of the proposed residential development in Bullsbrook with respect to achieving compliance with the requirements of the State Planning Policy 5.4 “Road and Rail Transport Noise and Freight Considerations In Land Use Planning” (SPP 5.4).

For reference the Structure Plan and development plan for Stages 1, 2, 5 and 7 are attached.

CRITERIA

In summary, the acoustic requirements are :

Under the Western Australian Planning Commission (WAPC) Planning Policy 5.4 “*Road and Rail Transport Noise and Freight Considerations in Land Use Planning*” (SPP5.4), we believe that the appropriate criteria for assessment for this development are as listed below for “Noise Limits”.

EXTERNAL

$L_{Aeq(Day)}$ of 60 dB(A); and
 $L_{Aeq(Night)}$ of 55 dB(A).

INTERNAL

$L_{Aeq(Day)}$ of 40 dB(A) in living and work areas; and
 $L_{Aeq(Night)}$ of 35 dB(A) in bedrooms.

Noise received at an outdoor area should also be reduced as far as practicable, with an aim of achieving an L_{Aeq} of 50 dB(A) during the night period.

MODELLING

Noise model was undertaken for the revised plans attached and was based on the previous model used for the "Updated Acoustic Assessment" undertaken in February 2018 (HSA reference : 22753-3-16264-02). However, it is noted that from the MRWA Traffic Map, the percentage of heavy vehicles along Chittering Road has dropped to 3.6%. Thus the modelling takes into account this change in heavy vehicles.

Additionally, as stated in the assessment report, the difference between the $L_{Aeq,16hr}$ and the $L_{Aeq,8hr}$ for both Great Eastern Highway and Chittering Road would be greater than 5 dB(A).

As the difference between the $L_{Aeq,16hr}$ and the $L_{Aeq,8hr}$ would be greater than 5 dB(A), achieving compliance with the day period criteria will also achieve compliance with the night period criteria. Therefore, noise modelling was only undertaken for the day period. Noise contours are attached for the following scenarios :

Figure A1 - Base case for future traffic (ie without and mitigation or residences); and
Figure A2 - Future traffic with noise mitigation and residences.

Note : The noise mitigation being a 2 metre high fence to the boundary to Chittering Road for Lots 1 and 12.

COMPLIANCE WITH SPP 5.4

The noise modelling indicates that noise received at the residences located adjacent to Chittering Road would exceed the "Noise Limits". To achieve compliance with the requirements of State Planning Policy 5.4, the following are recommended :

- Quiet House design to residences, as shown on Figure M1.
- 2m high barrier to the boundary to Chittering Road for Lots 1 and 12.

Note : The barrier to Lots 1 and 12 is to achieve compliance with outdoor requirement. For the other residences facing Chittering Road, the residences themselves provide a sufficient barrier for compliance within the back yards to be achieved.

It is also noted that for residence where the noise level exceed the $L_{Aeq(Day)}$ of 55 dB(A), Notification on Titles are required. The lots requiring "Quiet House" design and / or Notification on Titles are attached in Figure M1.

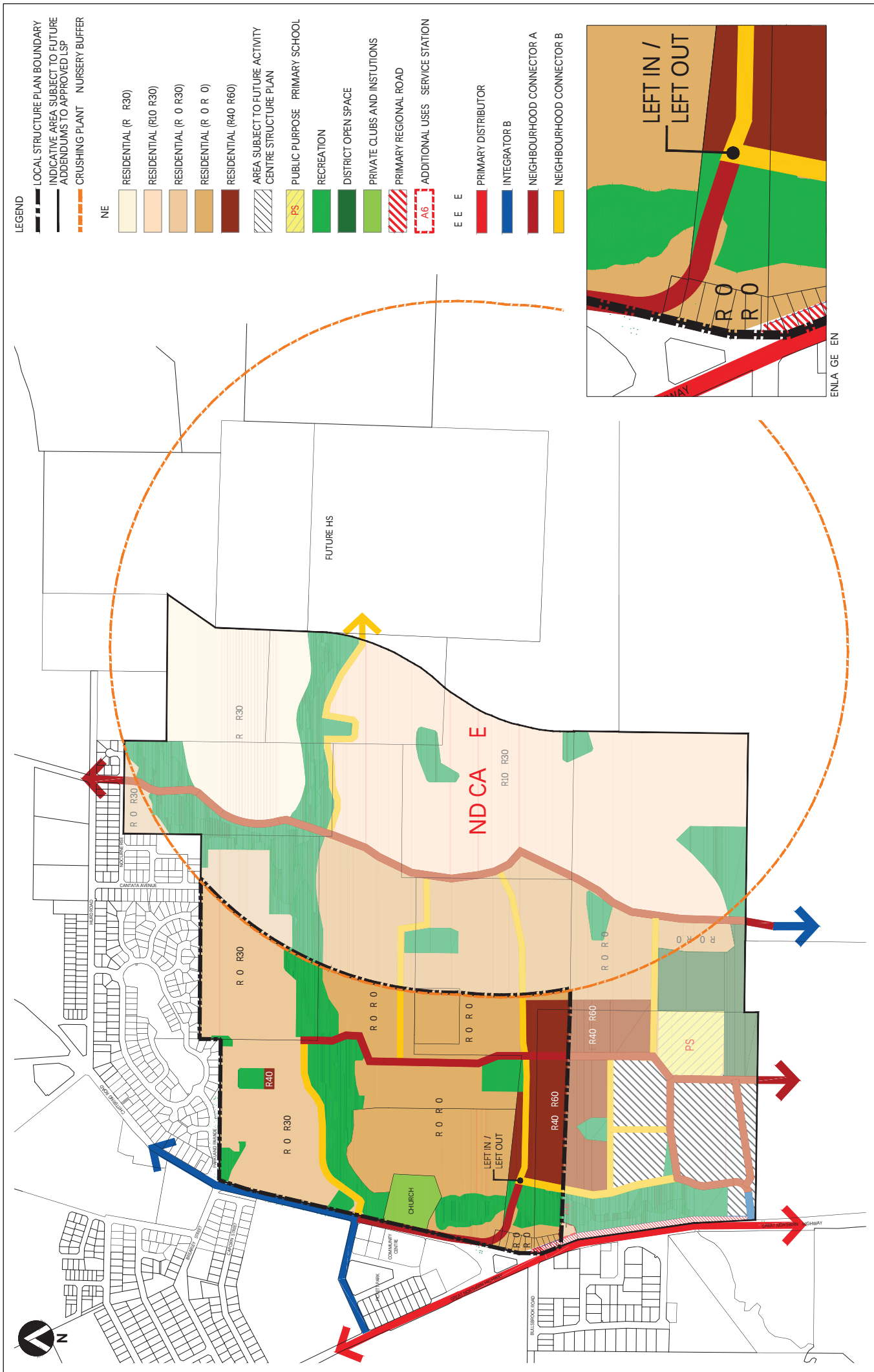
The Package A "Quiet House" design requirements for residences located adjacent to Chittering Road are attached for information.

Note : The construction requirements listed for Package A are "deemed to satisfy" construction. Alternative constructions are acceptable, provided they are supported by a report from a suitably qualified acoustic consultant.

Yours faithfully,
For **HERRING STORER ACOUSTICS**

Tim Reynolds

Att.



LEGEND

- LOCAL STRUCTURE PLAN BOUNDARY
- INDICATIVE AREA SUBJECT TO FUTURE ADDENDUMS TO APPROVED LSP
- CRUSHING PLANT
- NURSERY BUFFER
- NE
- RESIDENTIAL (R R30)
- RESIDENTIAL (R10 R30)
- RESIDENTIAL (R 0 R30)
- RESIDENTIAL (R 0 R 0)
- RESIDENTIAL (R40 R60)
- AREA SUBJECT TO FUTURE ACTIVITY CENTRE STRUCTURE PLAN
- PUBLIC PURPOSE PRIMARY SCHOOL
- RECREATION
- DISTRICT OPEN SPACE
- PRIVATE CLUBS AND INSTITUTIONS
- PRIMARY REGIONAL ROAD
- ADDITIONAL USES SERVICE STATION
- E E E
- PRIMARY DISTRIBUTOR
- INTEGRATOR B
- NEIGHBOURHOOD CONNECTOR A
- NEIGHBOURHOOD CONNECTOR B



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YMMDD: 18/01
DWG REF: 006a
PROJECTION: PCG 4
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LOCAL STRUCTURE PLAN
Bullsbrook
City of Swan
REV. NO. DRAW NO. REV.
A B L D1.07
P NEIGHBOURHOOD CONNECTOR B UPDATE
Q POS LSP BOUNDARY UPDATE
R VOLUME UPDATE
M UPDATED R40 CODE AREA
L UPDATED CONNECTORS
REV DESCRIPTION
YMMDD DRAWN APPR D
11.0 HH AB
11.03 HH AB
1.01 HH TT
1.00 HH AB
YMMDD DRAWN APPR D

QUIET HOUSE DESIGN DEEMED-TO-SATISFY CONSTRUCTIONS FOR PACKAGE A

Area	Orientation to road corridor	Package A
Bedrooms	Facing	• Walls to R_w+C_{tr} 45dB • Windows and external door systems: Minimum R_w+C_{tr} 28dB (Table 6.4), total glazing area up to 40% of room floor area. [if R_w+C_{tr} 31dB: 60%] [if R_w+C_{tr} 34dB: 80%] • Roof and ceiling to R_w+C_{tr} 35dB (1 layer 10mm plasterboard)
	Side-on	• As above, except glazing R_w+C_{tr} values for each package may be 3dB less, or max % area increased by 20%
	Opposite	• No requirements
Indoor living and work Areas	Facing	• Walls to R_w+C_{tr} 45dB • Windows and external door systems: Minimum R_w+C_{tr} 25dB (Table 6.4), total glazing area limited to 40% of room floor area. [if R_w+C_{tr} 28dB: 60%] [if R_w+C_{tr} 31dB: 80%] • External doors other than glass doors to R_w+C_{tr} 26dB (Table 6.4)
	Side-on	• As above, except the glazing R_w+C_{tr} values for each package may be 3dB less, or max % area increased by 20%
	Opposite	• No requirements
Other indoor areas	Any	• No requirements

Note : Alternative constructions are acceptable, provided they are supported by a report prepared by a suitably qualified Acoustical Consultant.

MINIMUM ACOUSTIC RATING OF SELECTED EXTERNAL BUILDING EXTERIOR WALLS

Building Element	Type	$R_w + C_{tr}$, dB	Example Constructions
External wall	Steel framed	45	- One row of 92mm studs at 600mm centres with – • resilient steel channels fixed to the outside of the studs; and • 9.5mm hardboard or 9mm fibre cement sheeting or 11mm fibre cement weatherboards fixed to the outside of the channels; and • 75mm thick glass or mineral wool insulation with a density of 11kg/m³ or • 75mm thick polyester insulation with a density of 14kg/m³, positioned between the studs; and • two layers of 16mm fire-protective grade plasterboard fixed to the inside face of the studs.
			- One row of 92mm studs at 600mm centres with – • resilient steel channels fixed to the outside of the studs; and • one layer of 19mm board cladding fixed to the outside of the channels; and • 6mm fibre cement sheets fixed to the inside of the channels; and • 75mm thick glass or mineral wool insulation with a density of 11 kg/m³ or • 75mm thick polyester insulation with a density of 14 kg/m³, positioned between the studs; and • two layers of 16mm fire-protective grade plasterboard fixed to the inside face of the studs.
	Single leaf masonry, brick veneer	45	• Single leaf of 150mm brick masonry with 13mm cement render on each face.
		50	- Single leaf of 90mm clay brick masonry with – • a row of 70mm x 35mm timber studs or 64mm steel studs at 600mm centres; and • a cavity of 25mm between leaves; and • 75mm thick glass or mineral wool insulation with a density of 11kg/m³ or 75mm thick polyester insulation with a density of 14kg/m³ positioned between studs; and • one layer of 10mm plasterboard fixed to the inside face.
			Single leaf of 220mm brick masonry with 13mm cement render on each face.
			150mm thick unlined concrete panel.
Double brick	45	45	200mm thick concrete panel with one layer of 13mm plasterboard or 13mm cement render on each face.
			Two leaves of 90mm clay brick masonry with a 20mm cavity between leaves.
	50	50	- Two leaves of 90mm clay brick masonry with – • a 50mm cavity between leaves; and • 50mm thick glass wool insulation with a density of 11kg/m³ or 50mm thick polyester insulation with a density of 14 kg/m³ in the cavity; and • Where wall ties are required to connect leaves, the ties are of the resilient type.
			- Two leaves of 110mm clay brick masonry with – • a 50mm cavity between leaves; and • 50mm thick glass wool insulation with a density of 11kg/m³ or 50mm thick polyester insulation with a density of 14 kg/m³ in the cavity.

MINIMUM ACOUSTIC RATING OF GLAZED ELEMENTS

Building Element	Type	Airborne weighted sound reduction rating with traffic correction R_w+C_{tr} , dB	Building element Type Airborne weighted sound
Window, uPVC, aluminium or timber frame	Sliding or double hung opening	23	4mm monolithic glass
		26	- Single pane glazing to R_w 33dB 6mm monolithic or laminated glass 6mm toughened safety glass '6-12-6' double insulated glass unit (IGU)
		29	- Single pane glazing to R_w 36dB 10mm monolithic (aka float) glass 10mm laminated or toughened safety glass 6mm-12mm-10mm double insulating
	Fixed sash, awning or casement type opening	26	4mm monolithic glass
		31	- Single pane glazing to R_w 33dB 6mm monolithic or laminated glass 6mm toughened safety glass '6-12-6' double insulated glass unit (IGU)
		34	- Single pane glazing to R_w 36dB 10mm monolithic (a.k.a. float) glass 10mm laminated or toughened safety glass 6mm-12mm-10mm double insulated glass unit (IGU)
Single external door, aluminium uPVC or timber frame	Fully glazed sliding door	24	6mm monolithic or laminated 5 or 6mm toughened safety glass
		27	10mm monolithic or laminated 10mm toughened safety glass
	Fully glazed hinged door	28	- Certified R_w 31dB acoustically rated door and frame including seals 6mm monolithic or laminated 5 or 6mm toughened safety glass
		31	- Certified R_w 34dB acoustically rated door and frame including seals 10mm monolithic or laminated 10mm toughened safety glass
	Solid core timber frame, side hinged	26	- Certified R_w 28dB acoustically rated door and frame system including seals 35mm solid core timber
		30	- Certified R_w 32dB acoustically rated door and frame system including seals 40mm solid core timber without glass insert 40mm solid core timber with not less than 6mm

Appendix 3

Local Water Management Strategy (RPS)

MEMO

Date: 07 September 2021
Pages: 4 inc. this page
Regarding: Kingsford Local Structure Plan

Revised Local Structure Plan for Kingsford, Bullsbrook – Local Water Management Strategy

1 Background

Hatch RobertsDay, on behalf of Okeland Communities, are submitting a revised Local Structure Plan (LSP) for the Kingsford, Bullsbrook development. The revised LSP is attached in Appendix A and changes include:

- Lifting of Urban Deferment over the balance of the Kingsford landholding
- Changes to the Town Centre layout and zones as per the Town Centre Precinct Plan

2 Local water management strategy

A local water management strategy (LWMS) was previously prepared by RPS (2018) to support the 2017 LSP. The LWMS was prepared over the entire LSP area, including the Urban Deferred zone. The LWMS was approved by the Department of Water and Environmental Regulation (DWER) on 25 June 2018. The overall water management strategy and drainage discharge locations to the Ki-it Monger Brook have not changed.

An addendum to the LWMS was prepared by RPS (2021) to support the Town Centre Precinct Plan. The addendum addresses changes to the proposed layout and zones, impacts on the Town Centre and upstream catchments, and changes to modelled discharge rates (which are consistent with those prescribed in the original approved LWMS).

The water management for the revised LSP is adequately covered by the LWMS (RPS 2018) and the LWMS addendum (RPS 2021). Other than those layout changes which have already been addressed in the LWMS addendum, there are no changes to land use that will materially impact the drainage strategy and preliminary drainage design as documented in the LWMS and LWMS addendum reports. Although there may be slight changes to drainage catchments, these changes will not be clearly defined until subdivision stage and can be managed according to the key stormwater management criteria outlined in the aforementioned documents and summarised below.

3 Key stormwater management criteria

All catchments discharge to the Ki-it Monger Brook in the 100 year ARI event. Where catchments are adjacent to the brook, they will provide storage and attenuation within the foreshore public open space (POS) prior to discharge to the brook. The remaining catchments will provide storage and attenuation within local POS prior to discharging to the brook via the Town Centre. The LWMS addendum (RPS 2021)

MEMO

Date: 03 September 2021
Regarding: Kingsford Local Structure Plan

estimated a 100 year ARI pro rata discharge rate of 0.03 m³/s/ha for these catchments draining via the Town Centre.

There is flexibility for individual catchments to discharge more or less than the estimated allowable discharge rate in response to space availability for drainage infrastructure, however the LSP area should meet the overall discharge criteria outlined in the LWMS (RPS 2018). The ultimate discharge criteria at the Great Northern Highway within the Ki-it Monger Brook is 12 m³/s in the 100 year ARI 6 hour critical duration event.

4 References

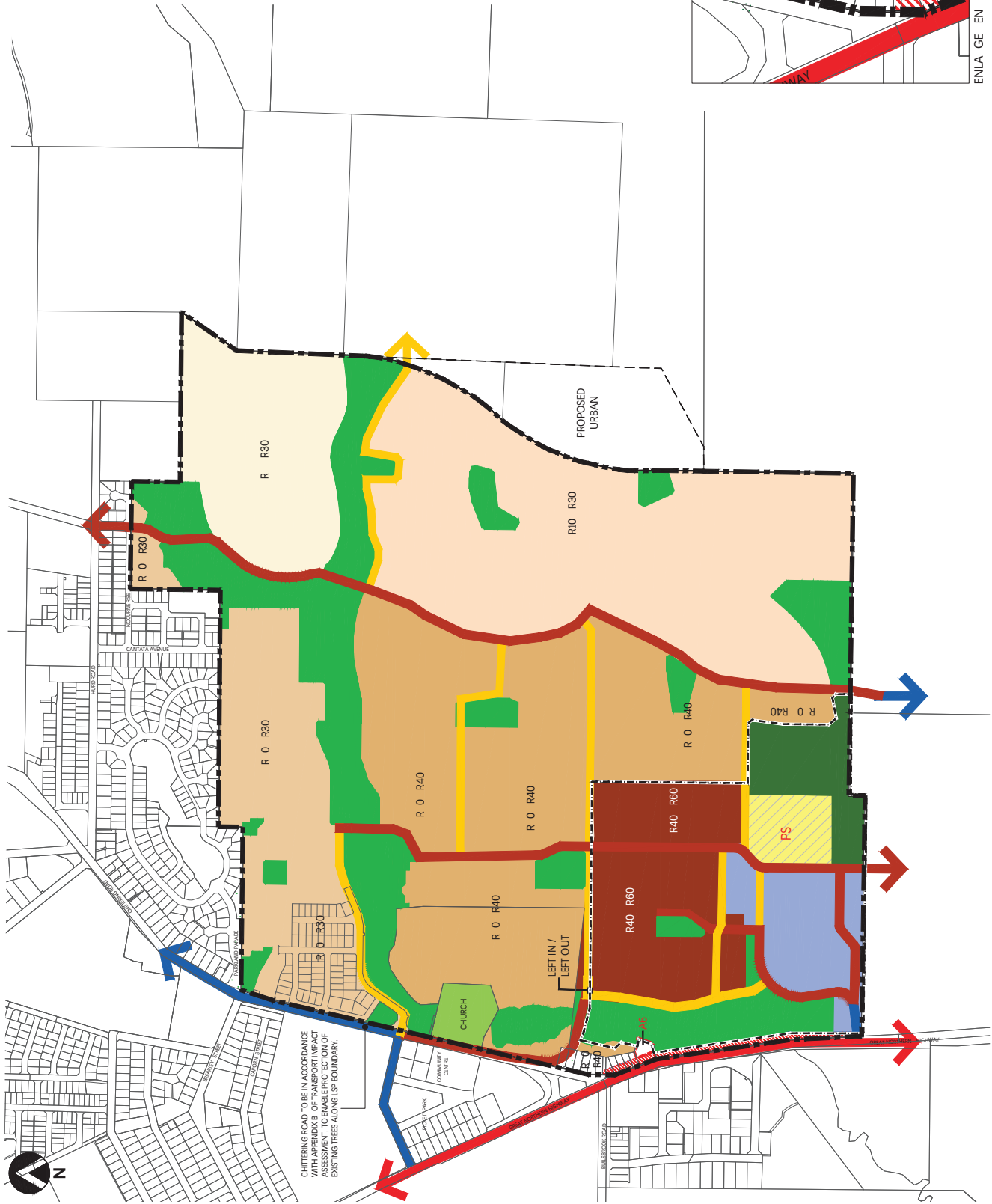
RPS (2018) *Local water management strategy – Bullsbrook Landholding*, prepared for Amex Corporation, report ref. EWP13024.007 Rev 4, May 2018.

RPS (2021) *Addendum to the Bullsbrook landholding local water management strategy*, memo dated 30 June 2021.

MEMO

Date: 03 September 2021
Regarding: Kingsford Local Structure Plan

Appendix A Kingsford Local Structure Plan (Hatch RobertsDay 2021)

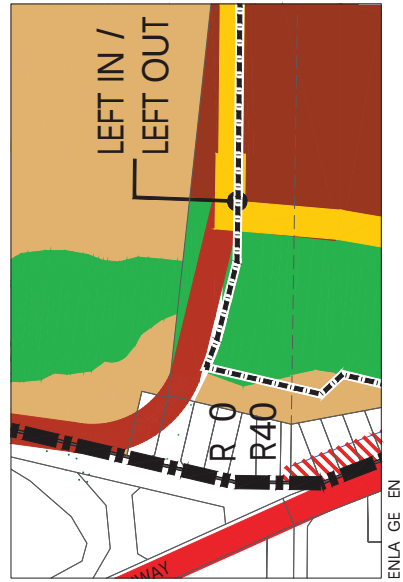


LEGEND

LOCAL STRUCTURE PLAN BOUNDARY (4.6ha)

AREA SUBJECT TO FUTURE PRECINCT PLAN

- NE
- RESIDENTIAL (R R30)
- RESIDENTIAL (R10 R30)
- RESIDENTIAL (R O R30)
- RESIDENTIAL (R O R40)
- RESIDENTIAL (R40 R60)
- GENERAL COMMERCIAL
- PUBLIC PURPOSE PRIMARY SCHOOL
- RECREATION
- DISTRICT OPEN SPACE
- PRIVATE CLUBS AND INSTUTIONS
- PRIMARY REGIONAL ROAD
- ADDITIONAL USES SERVICE STATION
- E E E
- PRIMARY DISTRIBUTOR
- INTEGRATOR B
- NEIGHBOURHOOD CONNECTOR A
- NEIGHBOURHOOD CONNECTOR B



HATCH | RobertsDay

SIZE A3
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SOURCE: MNG
YMMDD: 18101
DWG REF:
PROJECTION: PCG 4

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Appendix 4

Environmental Summary Report

(RPS)

ENVIRONMENTAL SUMMARY REPORT

Bullsbrook Landholding Local Structure Plan



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REPORT

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Appendix A: Bullsbrook Project Flora & Vegetation Assessment

Appendix B: Aboriginal heritage sites

SUMMARY

Okeland Pty Ltd (Okeland) has prepared a revised Local Structure Plan (LSP) to facilitate development within a 254 hectare (ha) portion of land in East Bullsbrook (the site). The Bullsbrook site is located within the City of Swan abutting the existing Bullsbrook town site, being approximately 35 kilometres (km) north-east of Perth and approximately 12 km north of Ellenbrook. The RAAF Base Pearce is located to the west of the land, and the future South Bullsbrook Industrial Precinct is located south-west of the site. A summary of the Bullsbrook site is provided in Figure A.

This Structure Plan provides an overarching planning framework to guide and facilitate the development of the Structure Plan area for urban purposes and has been prepared in accordance with the City of Swan Local Planning Scheme No. 17, Planning and Development (Local Planning Schemes) Regulations 2015 and associated Structure Plan Framework.

The plan provides for an integrated and coordinated approach to an appropriate mix of residential land uses and infrastructure, necessary to create a new, vibrant residential community in the Swan municipality.

The Structure Plan area is zoned a mix of 'Urban', 'Urban Deferred' and 'Rural' under the Metropolitan Region Scheme (MRS) and correspondingly 'Residential Development' and 'General Rural' under the City's Local Planning Scheme (LPS) No. 17.

Consent was provided by the Western Australian Planning Commission (WAPC) for the lodgement of this amendment to the structure plan concurrently with the 'lifting of Urban Deferment' zoning. The Structure Plan demonstrates how the subject area may be suitably developed for urban use to enable the residential development of the land once the 'Urban Deferred' zone is lifted.

The updated Structure Plan has a total area of 254 ha (Figure B).

Since the advancement of the scheme amendments in 2018, the structure plan and subdivision the Kingsford residential development has been substantially advanced. The City of Swan approved the Ki-it Monger Brook foreshore and wetland management plan in 2018. DWER and the City approved the LWMS in 2018.

Existing land use zoning context

The Bullsbrook site has been identified by the Western Australian Planning Authority (WAPC) as a "Future Urban Area" in the following key planning reports:

- Directions 2031 and Beyond
- Perth and Peel Sub-Regional Strategy
- "Future Residential" in the City of Swan's draft Bullsbrook Town Site Expansion Master Plan.

The amended Structure Plan area is zoned "Urban" under the MRS and "Urban Deferred". An application to This LSP will assist in guiding the future land use zoning and development of the land subject to MRS amendment. The western portion of Lot 1354 is reserved as "Primary Regional Roads".

An amendment to the City's LPS 17 zoning and reservations is being advanced concurrently with the LSP to be consistent with the MRS 'Urban' zoning.

Concurrent with the MRS amendment, Amex is advancing this LSP for the Bullsbrook site. The LSP defines the key proposed land uses within the site including:

- Residential development
- "New" Bullsbrook town centre
- District playing fields
- Local roads
- Realignment of a portion of Chittering Road through an existing (and cleared) road reserve
- Public open space (POS)
- Primary and secondary school sites

- Ki-It Monger Brook conservation open space area
- Stormwater drainage areas.

The updated Bullsbrook LSP is shown in Figure B.

Purpose of this report

The purpose of this Environmental Summary Report is to:

1. Review of the existing environment and address key environmental factors that may be impacted as a result of future development.
2. Outline the management measures that will be adopted to mitigate any potentially significant environmental impacts from future development.
3. Facilitate the approval of the LSP with the City of Swan and the WAPC by providing a land use framework to coordinate residential subdivision and development.

Bullsbrook site environment

Historically, the LSP site has been extensively cleared for agricultural purposes and consists largely of grassed paddocks used for cattle grazing and therefore has limited environmental values. The remnant trees are predominately located along an existing seasonal creekline (Ki-It Monger Brook) and on the central and hill ridges.

The key areas of environmental value within the site are Ki-It Monger Brook and discrete pockets of remnant vegetation. The following environmental factors are addressed in this EAR, identifying management requirements through the LSP and sequential planning stages:

- Flora and vegetation
- Fauna habitat
- Hydrological processes
- Heritage
- Acid sulfate soils
- Bushfire risk.

Bush Forever Site No. 86 is located to the north of the Bullsbrook site and is not proposed for development and therefore is not included in the structure plan.

Key environmental outcomes

The LSP promotes the preparation and implementation of following key environmental management plans:

1. Ki-It Monger Brook and Wetland Management Plan, which it is anticipated, will be a requirement of subdivision. The Ki-It Monger Brook FMP will appropriately detail the location of community facilities, open space areas, possible drainage areas and access pathways. This management plan was prepared and approved by the City of Swan in 2018.
2. Remnant Vegetation Management Plan to outline management recommendations for the stand of remnant Guildford vegetation community located on the southern boundary of the site.
3. Urban Water Management Plan(s).
4. Remediation of the Class I Inert Landfill to the satisfaction of the City of Swan by the current landfill proponent. This will outline the decommissioning of the landfill site and will address the decommissioning and rehabilitation and post-rehabilitation monitoring.

Table 2 summarises the key environmental issues within the site and the proposed management responses and timing.

Table 1: Summary of key potential environmental impacts and proposed management measures

Environmental Issue	Environmental objective	Applicable legislation and/or guidelines	Potential impacts	Management measures	Timing
Vegetation and flora	To maintain representation, diversity, viability, and ecological function at the species, population and community level	<i>Environment Protection and Biodiversity Conservation Act 1999</i> <i>Wildlife Conservation Act 1950</i> - Position Statement No. 2: Environmental Protection of Native Vegetation in Western Australia (EPA 2000).	The LSP site is predominately located within the existing cleared paddocks on the site. Within the site, the key native vegetation areas are located within Ki-it Monger Brook and pockets of remnant vegetation on the southern boundary of Lot 1314 (Figure L).	- The mature trees in the Ki-it Monger Brook will be retained along with representative vegetation from the Guildford Complex. - The LSP incorporates the objectives of EPA Bulletin No. 20: Protection of natural areas through planning and development through: - Ensuring adequate representation of ecological communities - Protecting areas of high diversity (Bush Forever Site No. 86) - Protecting areas containing rare or threatened species or communities (Bush Forever Site No. 86). - Maximise size and shape of naturally vegetated areas - Protect best condition naturally vegetated areas. - The maintenance of flora and vegetation will be managed at the structure planning and subdivision stages through the following: - Ki-It Monger Brook Foreshore Area Report – <u>completed</u> - Remnant Vegetation Management Plan - Fire Management Plan – <u>completed for approved subdivisions</u>	Management plans will be prepared at subdivision stage
Fauna	To maintain the abundance, diversity, geographic distribution and productivity of fauna species and ecosystem levels through the avoidance or management of adverse impacts and improvement of knowledge	- EPA Draft GS No. 56 - EPA GS No. 54 - EPBC Act (1999) <i>Wildlife Conservation Act 1950</i>.	The LSP site area is predominately located within the existing cleared paddocks on the site. The potential impacts include: - Disturbance from construction and human activities within retained vegetation, e.g. effects of noise, dust, light and vehicles - Loss of fauna or injury due to collisions - Introduction or spread of vermin due to introduced species or vermin	- The Local Structure Plan will into account the EPA Bulletin No. 20: Protection of natural areas through planning and development. Accordingly, the following environmental planning objectives will be addressed: - Ensure adequate representation of ecological communities. - Protect areas of high diversity (Bush Forever Site No. 86). - Protect areas containing rare or threatened species or communities. - Maximise size and shape of naturally vegetated areas. - Protect best condition naturally vegetated areas. - The maintenance of fauna will be managed at the structure planning and subdivision stages through the following: - Ki-It Monger Brook Foreshore Area Report – <u>completed</u> - Remnant Vegetation Management Plan - Fire Management Plan – <u>completed for approved subdivisions</u>	Management plans will be prepared at subdivision stage
Acid sulfate soils (ASS)	To maintain the quality of land and soils so that the environment values, both ecological and social, are protected.	- Assessment Levels for Soil, Sediment and Water (Department of Environment and Conservation [DEC] 2010) - Acid Sulfate Soils Guideline Series, Treatment and Management of Soils and Water in Acid Sulfate Soil Landscapes (DEC 2011) - Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes (DEC 2013).	Acidification and release of heavy metals from acid sulfate soils (ASS) into groundwater and seasonal freshwater environment of Ki-it Monger Brook	The final fill levels, and subsequent excavation (e.g. for sewer lines/engineering services) and dewatering requirements, will dictate whether a preliminary investigation and an ASS and Dewatering Management Plan (ASSDMP) is required to be prepared prior to development at the site occurring	ASSDMP to be prepared at subdivision stage (if required)
Hydrological processes	To maintain the hydrological regimes of groundwater and surface water so that existing and potential uses, including ecosystem maintenance, are protected	Better Urban Water Management (WAPC 2008).	- Change in hydrological regime as a result of changed landforms (from earthworks), which may alter natural flows and levels - Discharge of stormwater may affect the quality of groundwater and surface water	- Ki-It Monger Brook buffer has been defined in the Local Structure Plan in accordance with DWER's Identifying and establishing waterways foreshore areas (DoW 2012) - A Local Water Management Strategy (LWMS) has been prepared and approved for the LSP in accordance with WAPC's Better Urban Water Management framework – <u>completed</u>. - An Urban Water Management Plan will be completed at the subdivision stage in accordance with the Better Urban Water Management framework and to the satisfaction of the City of Swan - Ki-It Monger Brook Foreshore Area Report – <u>completed</u>. - Wetland Management Plan for the small Conservation Category Wetland area (UFI 12681). This wetland portion of the Ki-it Monger Brook was incorporated in the 2018 approved Ki-it Monger Brook FMP.	LWMP been prepared to support the LSP. UWMP(s) to be prepared at subdivision stage
Wetland	To maintain the integrity and ecological functions of any wetlands within the LSP site	- Wetlands Conservation Policy for Western Australia (Government of Western Australia 1997) - Environmental Protection (Swan Coastal Plain Lakes) Policy (EPA 1992) - Guideline for the Determination of Wetland Buffering Requirements (WAPC 2005b).	- Earthworks may directly or indirectly impact the wetlands and associated vegetation - Unauthorised access, which may degrade vegetation - Weed invasion - Drainage, which may alter wetland function and hydrology.	The wetland interface management treatments will be finalised and agreed through landscape plans and the City of Swan. This was completed as part of the 2018 approved Ki-it Monger Brook FMP.	Subdivision

REPORT

Environmental Issue	Environmental objective	Applicable legislation and/or guidelines	Potential impacts	Management measures	Timing
Heritage	To ensure that historical and cultural associations are not adversely affected	- Aboriginal Heritage Act 1972 - Guidance Statement No. 41: Assessment of Aboriginal Heritage (EPA 2004b).	- There is a mythological site mapped over the Ki-It Monger Brook. Data regarding this site is not available for public viewing until permission has been sought and granted from the appropriate traditional owner group. - Excavation / construction activities may unearth and/or damage artefacts or other items of cultural Aboriginal significance	- A suitably qualified cultural heritage consultant was appointed to investigate the extent of the mythological site and undertake a cultural assessment. An application for approval to disturb the Aboriginal archaeological site under Section 18 of the <i>Aboriginal Heritage Act 1972</i> has been made. - A Section 18 of the <i>Aboriginal Heritage Act 1972</i> was approved in 2018. - Be vigilant during earthworks and stop work immediately should any items be discovered. Notify the Department of Aboriginal Affairs.	Prior to construction
Contamination	To ensure that human health is not adversely affected	- Contaminated Sites Act 2003 - Department Environment Regulation Contaminated Sites Guidelines series	A landfill site is located on Lot 2792, however the landfill ceased operations in 2020.	The landfill site ceased operations in 2020. The landfill site will be remediated but the landfill operators to DWER remediation standards.	During subdivision stage
Bushfire risk	To reduce the risk of bushfire to people, property and infrastructure.	- Australian Standard 3959:2009: Construction of Buildings in Bushfire-prone Areas (Standards Australia 2009) - Guidelines for Planning in Bushfire Prone Areas (Department of Planning and WAPC 2015a) - SPP 3.7: Planning in Bushfire Prone Areas (Department of Planning and WAPC 2015b).	Future development within the LSP site will result in an increased risk to people, property and infrastructure being impacted by potential bushfires in retained vegetation along Ki-It Monger Brook	- Bushfire assessment and management framework will be prepared for the future Local Structure Plan includes BAL ratings. - Development and implementation of an approved Bushfire Management Plan – <u>completed for each approved subdivision</u>.	During subdivision stage

1.3 Planning context

A significant portion of the site has been identified by the WAPC as a “Future Urban Area” in the following key planning reports:

- Directions 2031 and Beyond
- Perth and Peel Sub-Regional Strategy
- “Future Residential” in the City of Swan’s draft Bullsbrook Town Site Expansion Master Plan (Figure C).

The Bullsbrook site has been identified by the Western Australian Planning Authority (WAPC) as a “Future Urban Area” in the following key planning reports:

- Directions 2031 and Beyond
- Perth and Peel Sub-Regional Strategy
- “Future Residential” in the City of Swan’s draft Bullsbrook Townsite Expansion Master Plan.

The amended Structure Plan area is zoned “Urban” under the MRS. This LSP will assist in guiding the future land use zoning and development of the land. The western portion of Lot 1354 is reserved as “Primary Regional Roads”.

The City’s LPS 17 zoning of the LSP area is “Residential Development” consistent with the MRS ‘Urban’ zoning. The western portion of Lot 1354 is reserved as “Primary Regional Roads”.

Concurrent with the MRS amendment, Amex is advancing this LSP for the Bullsbrook site. The LSP defines the key proposed land uses within the site including:

- Residential development
- “New” Bullsbrook town centre
- District playing fields
- Local roads
- Realignment of a portion of Chittering Road through an existing (and cleared) road reserve
- Public open space (POS)
- Primary and secondary school sites
- Ki-It Monger Brook conservation open space area
- Stormwater drainage areas.

The Bullsbrook LSP is illustrated in Figure B.

1.3.1 City of Swan Bullsbrook Townsite Land Use Master Plan

The Bullsbrook Townsite Land Use Master Plan (BTLUMP) provides a strategy for the future development of Bullsbrook town site and has been used as a base to guide design of the Structure Plan and allocation of land uses.

The BTLUMP proposes the Structure Plan area be developed for urban purposes as a mix of “District Centre”, “Future Residential”, “Conservation”, “District Open Space”, “Mixed Use”, “Public Open Space” and “Primary School”, as well as a “Rapid Transit Route” and “Rapid Transit Route Terminus” (Figure C).

The land use designations prescribed by the BTLUMP have been generally reflected by the LSP.

1.4 Environmental assessment context

1.4.1 Meeting with the Department of Water Regulation (DWER EPA Services)

RPS met with DWER EPA Services in 2013 to review the existing environment, potential environmental issues and importantly the identification of a “preferred” process for undertaking an environmental assessment of the landholdings in the context of the strategic planning undertaken by the WAPC and the City of Swan. The DWER EPA Services recognised the key environmental factors for the site were capable of being addressed through the Scheme Amendment and future planning stages.

The EPA / DWER – EPA Services has previously assessed the Bullsbrook East (Lots 3, 1165, 1396 and 60) (referred to as the Kingsford estate) on the following occasions:

- 2016 - Proposed Lifting of Urban deferment - Bullsbrook East - Portions of Lots 3, 1165, 1396, 1354 and 60
- 2017 - Metropolitan Region Scheme – Amendment 1324/41 Bullsbrook Central Urban Precinct
- 2018 – City of Swan – Local planning Scheme 17 – Amendment No. 158.

In each of the above assessments, the EPA considered the scheme amendments (or the lifting of urban deferment) is unlikely to have a significant effect on the environment and did not warrant formal assessment under Part IV of the EP Act.

1.5 Existing land uses

The majority of the site has been historically cleared to facilitate agricultural practices (Plate 1 and Plate 2) with the remnant native vegetation within the site restricted to Ki-It Monger Brook (Plate 3) and pockets of remnant vegetation.

Vegetation across the site ranges from “Completely Degraded” to “Degraded” condition. “Completely Degraded” areas occur across the vast majority of the site, consisting of cleared and grazed paddocks, dominated by pasture weeds. The small pockets of remnant plant communities were in “Degraded” condition, and contained an intact over-storey and a limited native understorey

Figure D illustrates the land uses within the site.



Plate 1: Existing agricultural land use within the site



Plate 2: Cattle grazing and existing dam within the site



Plate 3: Remnant vegetation (*Eucalyptus rudis*) within the Ki-It Monger Brook

1.5.1 Landfill site

The landfill site is an operational Class I inert landfill located within a portion of Lot 1288 Hurd Road, on the eastern boundary of the site (Figure D). The landfill is at the location of the former clay quarry site.

The site is licensed by the DWER as a prescribed premise under the *Environmental Protection Act 1986*. The licence number for the site is L8153/2004/2 which was issued in June 2011 and expired in 2020. The landfill site ceased operations in June 2020. Now closed, the landfill will be rehabilitated by the landfill operators in accordance with DWER requirements

Table 3 outlines DWER's permitted waste types in accordance with the licence. It is noted the permitted waste is inert building material.

Table 2: Class I Inert Landfill

Category number	Category description	Category production or design capacity	Premises production or design capacity
63	Class I inert landfill site: premises on which waste (as determined by reference to the waste type set out in the document entitled "Landfill Waste Classification and waste Definitions 1996" Published by the DEC chief executive officer and as amended from time to time*) is accepted for burial	200,000 tonnes per year	More than 50,000 but not more than 500,000 tonnes per year
13	Crushing of building materials: Premises on which waste building or demolition materials (for example bricks, stone or concrete) is crushed or cleaned	50,000 tonnes per year	Not more than 50,00 tonnes per year
62	Solid waste depot: Premises on which waste is stored, or sorted, pending final disposal or reuse	5,000 tonnes per year	More than 500 but no more than 5,000 tonnes per year

* Type I non-hazardous, non-biodegradable (half-life greater than two years) wastes containing contaminant concentrations less than Class I landfill acceptance criteria (DEC Landfill Waste Classification and Waste Definitions as Amended 2009) but excluding paper and cardboard.

The 'Urban Deferred' land in accordance with the WAPC's advice be transferred to a 'Urban' zoning noting the landfill has permanently ceased operations.

In this context, and to accommodate a sensible integrated long-term use for the former landfill site is proposed to be rehabilitated by the former landfill operators, for the land use(s) promoted in the LSP. This sequential land use is promoted by the DWER in Best Practice Environmental Management Draft Siting, Design, Operation and Rehabilitation of Landfills (DoE 2005).

1.6 Surrounding land uses

The key surrounding land uses to the Bullsbrook LSP are shown in Figure D.

1.6.1 Adjacent Lot 2430 nursery

The Swan Valley Nursery is located within Lot 2430 Great Northern Highway, adjacent to the southern boundary of site. The nursery focuses on producing herbs within enclosed greenhouses. The nursery currently operates in accordance with an approved development application and typically operates within standard working day times.

1.6.2 Residential

The existing Bullsbrook town site is located to the west of the LSP site and residential development, including a school and RAAF base, is located to the west and north-west of the subject land.