



Harley Dykstra

PLANNING & SURVEY SOLUTIONS

Lake Road Precinct A1 Structure Plan

Lake Road, Champion Lakes

Prepared by Harley Dykstra Pty Ltd

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ENDORSEMENT PAGE

This Structure Plan is prepared under the provisions of the City of Armadale Town Planning Scheme No.4

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

.....20 Sept 2018.....Date

Signed for and on behalf of the Western Australian Planning Commission:

..........

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

.....M. Wreclaw.....Witness

.....20 Sept 2018.....Date

.....20 Sept 2028.....Date of Expiry

TABLE OF AMENDMENT(S)

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

Executive Summary

Structure Plan Precinct A1 Lake Road, Champion Lakes

This report represents an application to the City of Armadale to consider a proposed Structure Plan comprising Lot 13 Poad Street and Lots 14-18 Lake Road, Champion Lakes ("Precinct A1"). Precinct A1 has a total area of 19.4292 ha and is situated approximately 1.1km south east of the Tonkin Highway, 21km south east of the Perth Central Business area and 3.8km west of both the Armadale and Kelmscott District Centres. Precinct A1 is situated on the south-east side of the Wungong River and is approximately 2.2km south of Champion Lakes Recreational Park.

The Structure Plan has been prepared concurrently to a Local Scheme Amendment to rezone Precinct A1 to "Urban Development." The Structure Plan will facilitate future subdivision and development of residential lots at Residential 25 (R25) and Residential 40 (R40) density.

The Structure Plan Summary Table below details the nature and key outcomes of the Structure Plan.

ITEM	DATA	STRUCTURE PLAN REF (section no.)
Total area covered by the Structure Plan	19.4292 ha	Section 1.2.1, 3.2.2
Area of each land use proposed:		
Residential	11.0039ha (57 %)	Section 3.3.1
Total estimated lot yield	336 lots	Section 1.1, 3.3.1
Estimated number of dwellings	336 dwellings	Section 1.1, 3.3.1
Estimated population	873 persons	Section 3.3.1
Estimated residential site density	30.5 dwellings per site hectare	Section 3.3.1
Estimated area and percentage of Public Open Space given over to:		
- Regional open space	Nil	-
- Local parks	1.8813 ha (10.0%)	Section 3.2.2

Part One - Implementation

1.0 Structure Plan Area

This Structure Plan shall apply to Lot 13 Poad Street and Lots 14-18 Lake Road, Champion Lakes being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map (**Plan 1**).

2.0 Operation

The date the Structure Plan comes into effect is the date the Structure Plan is approved by the WAPC.

3.0 Staging

Construction of the Poad Street/Lake Road roundabout shall occur prior to any subdivision or development in Development Area 48 taking vehicle access to/from Poad Street.

Other than the upgrading of the Poad Street/Lake Road intersection, there are no infrastructure triggers which shall influence the staging of future subdivision within Development Area 48.

4.0 Subdivision and Development Requirements

- 4.1 Subdivision within the Structure Plan area is to be in accordance with the residential density code prescribed by the Structure Plan.
- 4.2 Land use permissibility within the Structure Plan area shall be in accordance with the corresponding zone or reserve under the Scheme.
- 4.3 At the time of subdivision the following strategies and plans will be required via conditions of subdivision approval:
 - a) Urban Water Management Plan;
 - b) Landscape and Streetscape Plan;
 - c) Foreshore Management and Improvement Plan;
 - d) Bushfire Management Plan; and
 - e) Geotechnical Report.
- 4.4 Masonry uniform fencing shall be constructed in the locations shown on the approved Structure Plan.
- 4.5 At the time of subdivision a condition of subdivision approval is to be imposed requiring a notification to be placed on the Certificate(s) of Title(s) to advise that land or lots may be affected by a Bush Fire Hazard.
- 4.6 Residential density targets applied under Perth and Peel @3.5million and the Southern Metropolitan Peel Sub-Regional Structure Plan of 26 dwellings per residential site hectare are to be achieved.
- 4.7 Restrictive Covenants restricting access from Lake Road shall be placed on the Certificate(s) of Title(s) of those sites with direct frontage to Lake Road.
- 4.8 A roundabout shall be constructed at the intersection of Poad Street and Lake Road to the satisfaction of the Local Government, prior to any subdivision or development that facilitates vehicle access to/from Poad Street and Development Area 48 or prior to any development of Lot 13 Poad Street. The subdivider or

**Structure Plan
Precinct A1 Lake Road, Champion Lakes**

developer of Lot 13 Poad Street, or other subdivider/developer taking road access from Poad Street, shall make suitable arrangements with the Local Government for roundabout construction costs and the ceding of land free of cost (inclusive of any additional localised road widening not illustrated on the Structure Plan map).

- 4.9 As part of subdivision, suitable arrangements shall be made with the Local Government for the ceding of any localised road widening free of cost for the construction of proposed intersections with Lake Road.

5.0 Local Development Plans

Sites on the Structure Plan Map coded R40, abutting the PAW and at the intersection of the southern subdivisional road and Lake Road shall require a Local Development Plan.

Local Development Plans shall address the following matters:

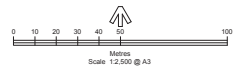
- lots where specific vehicle access and egress control is required; and
- lot orientation and passive surveillance.

Plan 1

Structure Plan Map



- Legend**
- Structure Plan Area
 - Residential R25
 - Residential R40
 - Public Open Space
 - Road Widening
 - Uniform Masonry Fencing
 - Floodway Extent
 - Floodfringe Extent
 - Dual Use Path
 - Pedestrian Crossing



John Chapman Town Planning Consultant
Proposed Local Structure Plan, Precinct A1
Lake Rd, Champion Lakes
Bluegold Corporation Pty Ltd

Date: 11.09.2018 File: 180911 JC-83 Lake Rd Champion Lakes-Colors-NoLots.dwg

Part Two - Explanatory Report

DOCUMENT CONTROL

Control Version	DATE	Status	Distribution	Comment
A	01/07/2015	Draft	Client	Review
B	13/07/2015	Final	City of Armadale	Requested amendments
C	24/05/2016	Final	City of Armadale	For lodgement
D	04/09/2017	Final	City of Armadale/WAPC	For Approval
E	11/09/2018	Final	WAPC	For Final Approval

Prepared for: Suncentro Land Trust

Prepared by: DM

Date: 11 September 2018

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Ref: 20170811Structure Plan – Version E

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1. PLANNING BACKGROUND

1.1. Introduction and Purpose

This submission has been prepared by Harley Dykstra on behalf of the Suncentro Land Trust in respect of Lot 13 Poad Street and Lots 14-18 Lake Road, Champion Lakes ("Precinct A1"). Precinct A1 forms the southern portion of Precinct A, and is bound by Wungong Brook to the south-west, Lake Road to the south-east, and Poad Street to the north-east. A Scheme Amendment to rezone the land from Rural Living 2 (RL 2) to Urban Development, Scheme Amendment No. 81 (SA 81), was gazetted on 5 December 2017.

The ultimate objective of this submission is to facilitate the subdivision and development of the land for residential land uses in a manner that interacts appropriately with both the developing urban environment in this locality and the Wungong River environs.

The intended land uses within the Structure Plan include:

- Approximately three hundred and thirty six (336) residential lots at density codings of R25 and R40; and
- Seven (7) areas of Public Open Space (POS) comprising both restricted and unrestricted POS, integrated with the Wungong River foreshore and located adjacent to Lake Road.

This proposal is accompanied by a Structure Plan (**Plan 1**) prepared in accordance with the Planning and Development (Local Planning Schemes) Regulations 2015, which is included at Part One of this Report.

The Explanatory section of this Structure Plan Report includes a detailed description of the proposal, provides an evaluation of the relevant town planning, environmental, fire management, local water management and servicing considerations applicable to the land, and details the rationale supporting the proposed Structure Plan.

The Structure Plan has been formulated by Harley Dykstra in collaboration with a team of specialist consultants, who have provided input in relation to matters as follows:

John Chapman Town Planning Consultant	- Urban design, town planning, project coordination
Bowman and Partners Environmental	- Environmental Report
Fire Plan WA/Smith Consulting	- Bushfire Management Plan
Development Engineering Consultants	- Engineering Services Report
JDA Consulting Hydrologists	- Local Water Management Strategy
Transcore	- Transport Assessment
Terra Verde Landscape Architect/Four Landscape Studio	- Landscaping Plan
Brown Geotechnical	- Geotechnical Investigations

Copies of the relevant consultant Reports are appended to this submission and key findings incorporated within the body of the Report. A Local Water Management Strategy (LWMS) has been prepared to support the Structure Plan and has been submitted concurrently to the Structure Plan Report under separate cover. The Consultants' Reports

confirm there are no significant constraints to progressing urban development of the land.

This Structure Plan Report also acknowledges previous planning, environmental and engineering work undertaken by others on land in the locality which has informed the preparation of this proposal.

Once the Structure Plan has been endorsed, it will be possible for urban development and subdivision to proceed in a co-ordinated manner as envisaged by the preceding rezoning of the land under the MRS and Town Planning Scheme No. 4 (TPS4).

1.2 Land Description

1.2.1 Location

Precinct A1 is located within the suburb of Champion Lakes and is situated approximately 1.1km south east of the Tonkin Highway, 22km south east of the Perth Central Business Area and 3.8km west of both Armadale and Kelmscott District Centres. Precinct A1 is situated on the south-east side of the Wungong River and is approximately 2.2km south of Champion Lakes Recreational Park (**Figure 1** refers).

Precinct A1 has an area of 19.4292 ha and has frontage to Lake Road and Poad Street, constructed and gazetted roads adjacent to the eastern and northern boundaries of Precinct A1 respectively.

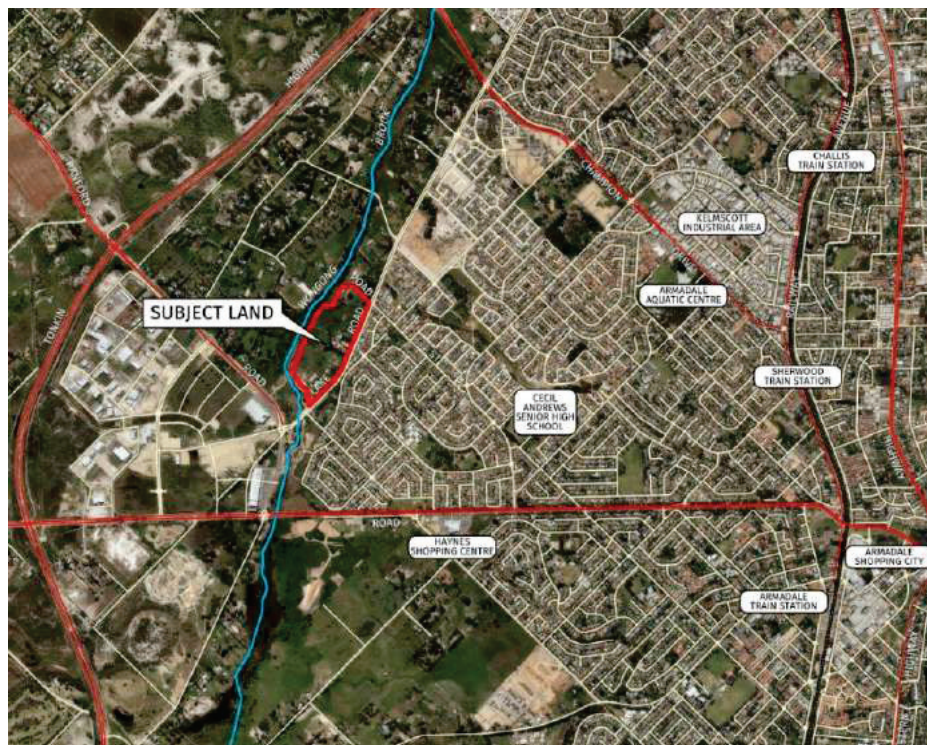


Figure 1 – Location Plan

1.2.2 Area and land use

The subject land is located within the City of Armadale, bounded to the south-east by Lake Road and the north-west by the Wungong River. Land adjacent to this site on the south-eastern side of Lake Road has been extensively developed for residential

purposes, with progressive development of estates to the north of the subject land increasing rapidly over recent years to meet market demand.

The Wungong River environs and reservations, whilst providing a barrier separating the subject land from the rural lifestyle and equestrian properties to the north-west, also provides an opportunity for environmental improvement, passive recreation and enhanced amenity to adjoining developments.

The Urban Development zoning and approved Structure Plan for Precinct B, and the Champion Lakes development further to the north, offer a mix of new land use compatible with the urban land use proposed for Precinct A1.

Land to the south west of the site is subject to the Armadale Redevelopment Scheme and includes Forrestdale Business Park and associated industrial and commercial land uses which is currently undergoing development.

Land use within Precinct A1 reflects the previous zoning under TPS4 and generally comprises rural living and low key equestrian uses. Precinct A1 contains four (4) dwellings all situated on the eastern part of the site adjacent to Lake Road. In addition, various outbuildings including yards for keeping horses and sheds have previously been constructed at the southern and eastern boundaries of the subject land. Lot 14, 17 and 18 contain man-made dams. A constructed drain, which services the Seville Grove residential area opposite Lake Road traverses Lots 15 & 16. The Aerial Photograph at **(Figure 2)** over page depicts the nature of existing land use within Precinct A1.

1.2.3 Legal description and ownership

Precinct A1 comprises of a total of six (6) lots. The aerial photograph at **Figure 2** identifies the individual landholdings. **Table 2** over page provides additional details in respect of the constituent lots.

Table 2 - Legal Description and Ownership

Lot No.	House No.	Plan / Diagram	Volume	Folio	Registered Proprietor(s)	Area (ha)
13 Poad Street	91	P12883	1541	80	Desmond John Itzstein Margaret Mary Itzstein	3.5619
14 Lake Road	538	P12883	1541	81	Desmond John Itzstein Margaret Mary Itzstein	3.4893
15 Lake Road	550	P12883	1541	82	Rodney Alexander Smith Mischell Leighanne Bojar	3.3822
16 Lake Road	556	P12883	1541	83	Abdelkarim Kheder Mazhar Kheder	2.8583
17 Lake Road	562	P12839	1572	975	Suncentro Pty Ltd	3.0091
18 Lake Road	580	P12839	1572	976	Suncentro Pty Ltd	3.1284
Total Area (ha)						19.4292

A copy of the Titles are included at **Appendix 1**.



Figure 2 – Aerial Photograph

1.3 Planning Framework

1.3.1 Zoning and Reservations

Metropolitan Region Scheme (MRS)

The MRS is the statutory land use planning scheme for the Perth Metropolitan Area. The primary purpose of the MRS is to reserve and zone land and control development on reserved and zoned land at the Regional level. The MRS reflects the agreed strategic direction for land in the metropolitan region and facilitates changes to planning controls at the local level and subsequent local area planning. Lake Road Precinct A was zoned “Urban” following gazettal of Scheme Amendment 1140/57 in 2008.

Development and subdivision in accordance with the proposed Structure Plan is consistent with the Urban zoning under the MRS.

Lake Road is identified as an ‘Other Regional Road’. A 1015m² portion of the subject land (excluding the additional road reserve required for the Poad Street/Lake Road roundabout) is currently affected by the Lake Road reservation. The Wungong River is contained within a Parks and Recreation Reserve. No widening of this reserve was required as part of Scheme Amendment 1140/57.

Land to the southeast is zoned Urban under the MRS and has been developed for residential land use.

City of Armadale Town Planning Scheme No. 4

The subject land was rezoned from Rural Living 2 (RL 2) to Urban Development as part of Scheme Amendment 81 under TPS 4, in order to facilitate residential development and subdivision.

An Urban Development zoning, underpinned by a Structure Plan prepared in accordance with the Planning and Development (Local Planning Schemes) Regulations 2015, provides the most appropriate and flexible mechanism to progress subdivision and development, having regard to the following objectives of the zone:

- (a) *“To provide for the orderly planning of large areas of land for residential and associated purposes through a comprehensive Structure Plan which is able to respond to changing circumstances throughout the developmental stages of the area; and*
- (b) *To promote the sustainable development of new urban communities in accordance with the social, environmental and economic goals of the City of Armadale.”*

TPS 4 identifies the subject land within Special Control Area - Flood Prone Areas - Flood Fringes. Clause 6.2 of TPS 4 sets out the requirements for development within Flood Prone Areas. The proposed Structure Plan has been prepared having regard to the relevant provisions of the Scheme.

Schedule 8 – Development (Structure Planning) Areas enables additional provisions applicable to subdivision and development to be incorporated into the Scheme. A suite of provisions applicable to Development Area 48 (Precinct A1 – Structure Plan Area) were included in Schedule 8 of TPS 4 via SA 81, as follows:

No.	Description of Land	Additional provisions applicable to subdivision and development
DA 48	Lots 13 Poad Street and 14-18 Lake Road (Precinct A1).	48.1 Comprehensive planning for the area shall be undertaken by preparation of a Structure Plan to guide subdivision and development. 48.2 A Local Water Management Strategy shall be prepared by a suitably qualified person at the expense of the subdivider or developer and approved by the City prior to Structure Plan approval. 48.3 As part of subdivision or development of the land existing trees and vegetation considered worthy of retention by the City shall be retained and protected at the expense of the subdivider or developer to the City's satisfaction. 48.4 As part of subdivision or development of the land, a Landscaping and Streetscape Plan for Public Open Space, drainage features and Road Reserves shall be prepared and implemented by a suitably qualified person at the expense of the subdivider or developer to the requirements and satisfaction of the City. The Landscaping and Streetscape Plan shall address the following matters to the City's satisfaction: a. An existing vegetation and tree condition assessment and tree survey shall be provided; b. The design and construction of Public Open Space and Road Reserves shall make provision for the retention of existing trees and vegetation considered worthy of retention by the City; c. The design and construction of drainage features within Public Open Space and Road Reserves shall be integrated with the overall landscaping design; d. Public Open Space shall be revegetated with local native species as required and approved by the City; e. Public Open Space shall include grassed areas as required and approved by the City; f. The provision of street trees using local native species as required and approved by the City; g. Reticulation of the Public Open Space and Street Trees shall be provided as required by the City and approved by the City; h. On street car parking bays adjacent to Public Open Space shall be provided; and

Continued over page...

		i. A connected pedestrian footpath network shall be provided and constructed as follows: i. On at least one side of every street; ii. Adjacent to Poad Street Road Reserve from Lake Road to the River; iii. Adjacent to Lake Road Reserve; iv. Adjacent to the Wungong River Foreshore; and v. The paths required under the points i to iii above shall be connected. 48.5 As part of subdivision or development of the land, the following plans shall be prepared, approved by the City and implemented by a suitably qualified person at the expense of the subdivider or developer to the requirements and satisfaction of the City: a. Foreshore Management and Improvement Plan; b. Midge and Mosquito Management Plan; c. Bushfire Management Plan; d. Urban Water Management Plan; e. Geotechnical Report. 48.6 Masonry uniform fencing shall be constructed in the locations shown on any approved Structure Plan and be visually permeable where required by the City. 48.7 Public open space shall be developed by the subdivider or developer in accordance with the Landscaping and Streetscape Plan prior to subdivision. 48.8 A minimum primary street dwelling setback of 4m, and a minimum garage setback of 4.5m, shall apply to all lots with an R25 density code within the Precinct A1 Structure Plan area.
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1.3.2 Regional and Sub-Regional Structure Plan

The Sub-Regional Planning Framework, finalised in March 2018, establishes the vision for future growth of the Perth and Peel Metropolitan Regions and provides a framework to guide the delivery of housing, infrastructure and services necessary to accommodate anticipated population growth through to the year 2050.

Consistent with the *Perth and Peel @ 3.5 million* document, the Sub-Regional Planning Framework seeks to achieve a residential density target equivalent to 26 residential dwellings per residential site hectare. The Sub-Regional Planning Framework consists of three sub-frameworks, namely for the North-West, the North-East and the South Metropolitan and Peel Regions. The subject land has been identified as 'Urban' under the draft South Metropolitan Peel Sub-Regional Planning Framework. The majority of properties between Lake Road and the Wungong River have been identified as Urban along with the existing development to the east. Land to the west of the subject land, on the opposite side of the Wungong River has been identified as Urban Expansion. Champion Lakes is identified as a location where further urban expansion is necessary to consolidate and 'round off' existing urban areas.

Thus, development of the subject land for residential land use is consistent with the South Metropolitan Peel Sub-Regional Planning Framework and shall facilitate planned residential development in the locality.

1.3.3 Planning Strategies

City of Armadale Local Planning Strategy

The City of Armadale Local Planning Strategy was finalised in December 2016 and is intended to set out the long-term planning direction for the City. The Strategy refers in particular to the Lake Road Precinct Champion Lakes and envisages the progression of Structure Plans in the area on a sub-precinct basis according to the conclusions of the necessary environmental and servicing investigations. Structure Plans should also result in local POS additions abutting the existing foreshore reserve along the Wungong River to act as a buffer protection of the river environment.

The proposed Structure Plan is consistent with the intention of the Local Planning Strategy and has been prepared having regard to the above considerations.

Wungong River Champion Drive to Armadale Road Management Plan 2010-2015

The *Wungong River Champion Drive to Armadale Road Management Plan 2010-2015*, includes a number of Strategic Directions, and actions that would assist in achievement of those directions. The actions identified in the Management Plan are general and relate to the whole Management Plan area. The proposed Structure Plan is consistent with the Wungong River Management Plan, in that it:

- Is supported by a LWMS, in accordance with the Better Urban Water Management framework;
- Facilitates provision of a long term multi-use trail system between Poad Street and Lake Road consistent with Figure 8 of the Wungong River Management Plan. The Structure Plan reflects the indicative location of the multi-use trail proposed by the Management Plan;

- Is supported by a Foreshore Management Plan, which facilitates improvements to riparian vegetation, weed control and fire management measures at subsequent planning stages (i.e. via a condition of subdivision approval); and
- Provides for ceding of land as Public Open Space adjacent to existing MRS reserves.

The points above demonstrate that the Structure Plan can be implemented with due consideration to the Wungong River Management Plan.

1.2.4 Planning Policies and Guidelines

State Planning Policy 3.7 – Planning in Bushfire Prone Areas

State Planning Policy 3.7 (SPP 3.7) seeks to guide the implementation of effective risk based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure. SPP 3.7 applies to strategic planning proposals, including Structure Plans, over land designated as bushfire prone by the *Map of Bushfire Prone Areas* prepared by the Department of Fire and Emergency Services.

Given Precinct A1 is designated as Bush Fire Prone, SPP 3.7 is applicable to the Structure Plan area. The requirements of SPP 3.7 are addressed by a Bushfire Management Plan prepared in support of the Structure Plan.

State Planning Policy 3 – Urban Growth and Settlement

State Planning Policy 3 (SPP 3) sets out the principles and considerations which apply to planning for urban growth and settlement in Western Australia. The Policy seeks to ensure well planned and coherent management of urban growth having regard to a range of social, economic and environmental objectives.

The key objectives of the Policy are:

- *“To promote a sustainable and well planned pattern of settlement across the State, with sufficient and suitable land to provide for a wide variety of housing, employment, recreation facilities and open space.*
- *To build on existing communities with established local and regional economies, concentrate investment in the improvement of services and infrastructure and enhance the quality of life in those communities.*
- *To manage the growth and development of urban areas in response to the social and economic needs of the community and in recognition of relevant climatic, environmental, heritage and community values and constraints.*
- *To promote the development of a sustainable and liveable neighbourhood form which reduces energy, water and travel demand whilst ensuring safe and convenient access to employment and services by all modes, provides choice and affordability of housing and creates an identifiable sense of place for each community.*
- *To coordinate new development with the efficient, economic and timely provision of infrastructure and services.”*

The proposed Structure Plan is consistent with each of the abovementioned objectives.

Liveable Neighbourhoods

The WAPC's Liveable Neighbourhoods is an operational policy that guides the design and assessment of Structure Plans (regional, district and local) and subdivision for new urban neighbourhoods in the metropolitan area and country centres, on greenfield and large urban infill sites. Liveable Neighbourhoods includes the following Principle Aims that are particularly relevant to the Study Area:

- *To foster a sense of community and strong local identity and sense of place in neighbourhoods and towns.*
- *To ensure the avoidance of key environmental areas and the incorporation of significant cultural and environmental features of a site into the design of an area.*
- *To provide for a more integrated approach to the design of open space and urban water management.*
- *To ensure cost-effective and resource-efficient development to promote affordable housing.*
- *To maximise land efficiency wherever possible.*
- *To provide a variety of lot sizes and housing types to cater for the diverse housing needs of the community at a density that can ultimately support the provision of local services.*

Liveable Neighbourhoods outlines that Structure Plans should depict:

- walkable neighbourhood catchments of approximately 400m–450m radius around proposed commercial centres;
- density targets expressed as dwellings per hectare;
- existing and proposed commercial centres;
- natural features to be retained;
- proposed street block layout;
- proposed street network, including street types and path networks;
- proposed transportation corridors, public transport network and cycle and pedestrian networks;
- proposed land uses, including distribution of higher, medium and lower density residential;
- proposed schools and community facilities;
- public parkland; and
- proposed urban water management measures.

Tables 1 and 2 identify the elements that are required to be addressed by the Structure Plan and/or subdivision application to allow assessment under Liveable Neighbourhoods.

A significant amount of research and reporting has been previously undertaken in support of the Urban rezoning of the site and surrounding land, through the preparation of Structure Plans on adjoining/nearby land. Relevant considerations pertaining to the abovementioned planning elements have been addressed in this Report, in order to demonstrate compliance with the intent of Liveable Neighbourhoods.

City of Armadale Local Planning Policies

Relevant Local Planning Policies prepared by the City of Armadale have been considered during the preparation of the proposed Structure Plan design and documentation.

1.2.5 Other approvals and decisions

Swan River Trust Development Control Area

The limit of the Development Control Area managed by the Department of Biodiversity, Conservation and Attractions (Rivers and Estuaries Division - former Swan River Trust) is described as the point the Southern River is crossed by Allen Road (Tonkin Highway). Hence the Structure Plan Area does not fall directly within the Swan River Trust Management Area. This notwithstanding, given the section of the Southern River almost immediately downstream of the subject land is within the management area, the Structure Plan was referred to the Rivers and Estuaries Division of DPaW (now DBCA) for comment. The recommendations provided by DPaW have been addressed in the Local Water Management Strategy (LWMS) and Foreshore Management Plan prepared in support of the Structure Plan.

Scheme Amendment No.62 and Precinct B Structure Plan

An application for a Local Scheme Amendment and Structure Plan over Lake Road Precinct B was submitted to the City of Armadale on 3 March 2011. Precinct B includes land adjacent to Lake Road between Bay Court and McNeill Road, 450m north of the subject land. The Scheme Amendment was adopted by the City of Armadale for advertising on 19 August 2012 and gazetted on the 10 December 2013 resulting in the rezoning of Precinct B from “Rural Living 2” to “Urban Development”.

The progression of a Structure Plan over Lake Road Precinct A1, is thus considered timely and a logical progression of redevelopment of the Lake Road Precinct.

1.2.6 Pre lodgment consultation

The Lake Road Precinct A1 Structure Plan has been subject to extensive ongoing consultation with the Department of Planning, City of Armadale and Department of Water.

Preliminary assessment comments were provided by the City of Armadale in correspondence dated 11 November 2015. Correspondence was also received from the Department of Water dated 9 November 2015 in relation to the accompanying LWMS. Comments provided by the City of Armadale and Department of Water have been comprehensively addressed by this Structure Plan Report, the corresponding LWMS and accompanying technical Appendices.

2. SITE CONDITIONS AND CONSTRAINTS

2.1 Biodiversity and natural area assets

The subject land is located adjacent to the Wungong River. The DEC Geomorphic Wetland Database Mapping identifies the subject land as Multiple Use wetland. A Resource Enhancement Wetland exists approximately 60m north-west of the subject land. This wetland or its buffer would not be affected by subdivision and development within the Structure Plan area.

The subject land is predominately cleared of vegetation with some scattered vegetation adjacent to Lake Road, surrounding existing residences and alongside the constructed drain running through Lot 15 Lake Road. The Environmental Report at **Appendix 2** concludes that due to the historic clearing of the Structure Plan area, the environmental values of the land are negligible. The disposition of vegetation on the land is illustrated by the Aerial Photograph at **Figure 2**.

There are a few scattered individual trees and copses of paperbark in the west of the site near the margins of Wungong Brook. There have been new plantings of non-indigenous Eucalypts including river red gums, blue gums and swamp mahogany variously throughout the land. The balance of the land sustains pasture grasses and weeds.

The Environmental Report prepared by Bowman Partners Environmental at **Appendix 2** concludes that in regard to fauna, the lack of natural habitats, resulting from the absence of native vegetation and predominance of open pastured fields, indicates very low carrying capacity and a lack of habitat diversity. The land supports low population densities of avian fauna typical for open pastured fields and non-indigenous tree habitats.

The fringing vegetation adjacent to the Wungong Brook represents the principal habitat area for fauna in the locality. These environmental features are located outside the Structure Plan area.

2.2 Landform and Soils

The site is generally flat, sloping gently in a north-westerly direction towards the Wungong River and associated reserve which form the north-western boundary of the subject land. The elevation of the land across the site varies between approximately 22.4m AHD at the western boundary adjacent to the Wungong River to 23.8m AHD along the eastern boundary adjacent to Lake Road. Three low points of 22.4m AHD are situated to the south of the site where man-made dams are currently located. The Bore Location Plan at **Appendix 3** illustrates the contours over the site.

The Environmental Report at **Appendix 2** notes that the land is mapped at a regional scale as Guildford Formation and forms part of the flood fringe of the Wungong River. The soils at the site are identified as being Alluvium: clay, loam, sand and gravel. During groundwater investigations, it was found that shallow sediments comprise a surface layer of grey to orange sand between approximately 0.2 m to 2.5 m thick, underlain by sandy clays, gravely clay and sandy gravelly clay to the maximum depth of drilling of approximately 5.0 m below ground surface.

Landgate mapping shows the site as having a moderate to low risk of Acid Sulphate Soils (ASS) or Potential Acid Sulphate Soils (PASS) occurring within 3m of the natural surface. The Environmental Report concludes following soil and groundwater sampling that there

are no significant occurrences of ASS within the land. In addition, the civil works required to develop the proposed Structure Plan will require the addition of fill within the site in order to meet necessary clearance between the highest groundwater levels and development levels for roads and buildings. This indicates that there will be minimal excavation works and therefore in combination these two factors indicate that there is negligible risk that management of ASS would be an issue requiring management.

A Geotechnical Report prepared by Brown Geotechnical is included as part of the LWMS for Precinct A1 (provided under separate cover). The Geotechnical Report estimates a total sand thickness of 1.8m will be required above the clayey subgrade soil to achieve a Class A site classification. Localised areas such as in the north of the subject land have sand depths in excess of 1.8m. These areas may be classed as Class 'A', but further investigation will be required to determine the extent with respect to individual Lots.

The Geotechnical Report advises that a thin layer of topsoil is present to about 0.2m. This is not suitable for foundation support and should be removed along with trees and roots and replaced with clean sand fill. The topsoil may be used in landscaping following the removal of any tree roots.

The site is not identified as being contaminated on the Department of Environment and Regulation (DER) Contaminated Sites Database, and groundwater quality analysis accompanying the Environmental Report confirmed the absence of contamination.

2.3 Groundwater and Surface Water

The Department of Water Groundwater Atlas indicates an average depth to groundwater of 1.5m or greater from the natural surface. The Environmental Report advises that the presence of a Superficial Aquifer beneath the surface results in the water table ranging from less than 1 metre below ground level (mbgl) to about 3mbgl. The groundwater elevation at the site is between 22m AHD to 24m AHD.

Groundwater flow is generally towards the Wungong River, in a westerly direction. Two stormwater channels traverse the Structure Plan area from Lake Road to the Wungong Brook, one along the lot boundary of Lot 13 Poad Street and Lot 14 Lake Road, and the other traversing Lot 15 and 16 Lake Road.

The Groundwater Report included at Appendix 1 of the Environmental Report, provides groundwater levels and quality from monitoring bores which were established in October 2014. These bores were monitored monthly for groundwater levels, and quarterly for groundwater quality to support the preparation of the LWMS by JDA Consulting Hydrologists.

The Environmental Report notes that the land is relatively flat and poorly drained due to shallow sediments within the site comprising a layer of sand overlying fine-grained clayey sediments with low permeability. Winter rainfall infiltration forms a perched aquifer beneath the site, the water table of which rises close to the ground surface throughout the site at its maximum annual level. Groundwater monitoring during late winter 2014 found that the water table was situated between less than 1m below ground level to approximately 3m below ground level. These shallow water table levels indicate that much of the site will need to be filled to meet water table separation distances required to meet urban engineering standards.

The Structure Plan Map illustrates the western portion of Precinct A1 occurs within the 100yr ARI flood fringe. Land within the flood fringe is able to be filled to accommodate development.

Other surface water features within Precinct A1 include two constructed drains connected to the adjacent Seville Grove residential area and various excavated soaks.

2.4 Bushfire Hazard

SPP 3.7 and the accompanying *Guidelines for Planning in Bushfire Prone Areas* (“The Guidelines”) require an appropriate level of assessment of land prone to bushfire risk at the Structure Planning stage. The Structure Plan area is designated as Bushfire Prone hence, a Bushfire Management Plan has been prepared to support the Structure Plan. A copy of the Bushfire Management Plan is included at **Appendix 4**. The Bushfire Management Plan confirms bushfire risk can be mitigated to achieve compliance with SPP 3.7 and the Guidelines. The objectives of the Bushfire Management Plan follow:

- Consider the land use proposal for the site and associated vehicular access.
- Identify the site’s vegetation, and surrounding vegetation, topography and proposed land use.
- Assess potential bushfire issues, hazards and the proximity of the site to predominant vegetation classes.
- Ensure water is available to enable property and life to be defended in event of a bushfire.
- Ensure the proposed re-vegetation of any portions of the site or an adjacent site minimises the level of bushfire impact.
- Outline the bushfire mitigation strategies for the site.
- Identify the stakeholders responsible for undertaking and implementing the bushfire mitigation strategies defined in this Bushfire Management Plan.
- Define an assessment procedure which will evaluate the effectiveness and impact of proposed, as well as existing, bushfire risk management measures and strategies.

The Bushfire Management Plan has been prepared having regard to the recommendations provided by the Department of Fire and Emergency Services (DFES) during advertising of the Structure Plan. The Bushfire Management Plan dated 7 June 2018 (and subsequently revised to include minor text changes on 10 September 2018) has been supported by DFES and will be implemented at subdivision stage.

2.5 Heritage

SA 81 and the Structure Plan were referred to the Department of Aboriginal Affairs (DAA) as part of the statutory advertising process. The DAA advised that whilst the Amendment (and Structure Plan) is within the public boundary of DAA 3511 (Southern River) it is not within the actual boundary administrated by the DAA. Therefore no approvals under the *Aboriginal Heritage Act 1972* are required.

It would only be at the time works are undertaken within the Wungong River Foreshore reserve, such as installation of pathways and emergency vehicle access, clearing for fire-breaks, weed control and construction of public infrastructure etc. that ground disturbance may occur (ie. following the Scheme Amendment, Structure Planning, Development and Subdivision approval process). The subdivider would review the *Aboriginal Heritage Due Diligence Guidelines* (Guidelines) to assist in determining what level of investigation should be undertake at that stage.

The City’s Municipal Heritage Inventory does not list any sites of relevance to the preparation of the Structure Plan.

3. LAND USE AND SUBDIVISION REQUIREMENTS

3.1 Land Use

3.1.1 Design Overview

The Structure Plan design has been developed having regard to the evolving strategic planning objectives for the locality, site specific environmental assessment, detailed engineering investigation, local water management and bushfire planning, having particular regard to the interface with the Wungong River foreshore reserve. The Structure Plan design also has due regard to recommendations received from the City of Armadale and various referral agencies during the assessment and statutory advertising process.

The Structure Plan has been prepared to guide the development of the 19.4292 ha site for residential subdivision. The Structure Plan will facilitate the development of a high quality, liveable urban precinct offering a diversity of lot products, and hence, housing choice, with access to the full range of urban services and facilities in the area, including primary and high schools, public open space and neighbourhood centres.

The design is based upon the existing network of roads defining the precinct and the interface with the Wungong River which will provide for a high level of amenity for residents. Detailed structure planning has been informed by an integrated approach with inputs from specialist consultants to appropriately address planning, water management environmental and bushfire management objectives. The urban development of the land will facilitate significant environmental improvement and management of the immediately adjoining River and environs whilst also enhancing public access, use and enjoyment of the River foreshore for the broader community.

Collectively, these factors have influenced the proposed road and lot layout, as depicted on the Structure Plan included as **Plan 1** at the Implementation section of this Report. Further details relating to the relevant design opportunities and constraints are provided below.

3.1.2 Integration with adjoining lots

The Structure Plan is bounded by the Wungong River to the west and south, Poad Street to the north and Lake Road to the east. Accordingly, the Structure Plan Area does not directly adjoin other privately owned land and can reasonably be considered a standalone planning precinct. This notwithstanding, the design of the Structure Plan recognises the location of the Wungong River foreshore reserve to the west of the site and ensures visual amenity of this reserve is not compromised and passive surveillance is increased.

The Structure Plan design also notes the existing residential development on the east side of Lake Road and the limitation on internal subdivision roads intersecting with Lake Road. The interface with Lake Road incorporates an extensive area of public open space to ensure where possible, future residential development orientates towards Lake Road and only a relatively short length of uniform fencing is proposed along Lake Road. The Structure Plan proposes four (4) intersections with Lake Road, connecting to the internal road network allowing for efficient movement through the Structure Plan area.

Linkages to the developing Structure Plan areas to the north shall also be reinforced by the provision of a system of footpaths and shared paths including a dual use path within the Wungong River Foreshore Reserve as depicted on the Structure Plan. In addition, a

pedestrian access way (PAW) will provide a strong pedestrian link between the Structure Plan Area and the existing Seville Grove residential development to the east.

3.2 Public Open Space

3.2.1 Existing POS

The subject land is well served by regional open space and recreational opportunities afforded by the site's proximity to Wungong River along the north-western boundary of the Structure Plan area. The subject land is located adjacent to Palomino Park, which runs alongside Wungong River, and 180m north-west of Barry Poad Reserve. Bob Blackburn Reserve containing the Armadale Aquatic Centre and a number of sport fields, is located 1.75km east, providing active and passive recreation opportunities.

Champion Lakes Recreational Park to the north of the subject land is a major recreational park within the South-East metropolitan region and includes an extensive dual use path system, areas for public open space and conservation areas. It is the only purpose built-facility of its kind in Western Australia.

3.2.2 Proposed POS

The design and location of Public Open Space with the Structure Plan area is intended to achieve the following aims:

- Integration with adjoining reserves to maximise available areas for a range of uses and functions, as well as achieving improved efficiencies in terms of maintenance and management;
- Providing a landscaped interface adjacent to Lake Road, where possible;
- Increasing passive interaction opportunities with other residents as a means to address social isolation and improve wellbeing;
- Be compatible with local water management requirements and accommodate drainage integrated with landscaping to improve useability and amenity for residents;
- Incorporate natural features, including existing trees where appropriate.
- Encourage maximum surveillance of POS areas to discourage opportunities for anti-social behaviour.

It is also acknowledged during the assessment of MRS Amendment 1140/57 the City advised the WAPC of the following objectives relating to the provision of POS:

"The Structure Plan should be prepared in association with a local scheme amendment and wherever possible, identify each lot capable of future subdivision as contributing 10% of the original lot area as Public Open Space in a linear or nodal parcel in the form of the following:

1. *Additional buffer strip/nodes adjacent to the existing foreshore reserve (MRS) along Wungong River*
2. *Buffer strip/nodes adjacent to the Multiple Use Corridor drainage reserves (existing or new) which run between Lake Road and the Wungong River*
3. *Buffer strip/nodes adjacent to existing road reserves especially where additional native vegetation can be retained*

4. *In locations for protection of locally valued environmental assets such as wetlands, rare flora species or vegetation, and/or*
5. *In appropriate locations, where points 1-4 above may not be appropriate, location the 10% POS from adjoining landholdings such that upon ceding they consolidate to form a contiguous parcel of POS parkland reserve greater than 4000sqm in area."*

The design, location and distribution of POS has regard to these principles as outlined above. POS areas A, B, E, F & G are all located adjacent to the foreshore reserve. POS areas C and D adjoin Lake Road and provide for the retention of trees.

The functionality of POS areas within the Structure Plan is illustrated by both the Landscape Masterplan Concept Plans provided at Appendix K and Engineering Plans, including basin cross-sections, at Appendix L of the LWMS, respectively.

A total of 1.8821ha of Public Open Space has been provided, some of which also serves a drainage function as detailed in the LWMS (including Engineering Plans) prepared to support the Structure Plan. The POS Calculations at **Table 3** and the POS Schedule included as **Table 4 overleaf** illustrate the subject land is required to provide 1.8813ha of land for public open space, in accordance with the 10% site contribution required by Liveable Neighbourhoods.

The drainage swale areas included as restricted open space have been calculated from the 1 in 5yr Top of Water (ToW) level area but exclude the 1:1 year ToW for all proposed swales referred to as N1, N2, S2 and S4 as detailed in Table 12 of the LWMS and Engineering Plans including cross sections at **Appendix 5**. Where there is any inconsistency between the LWMS and Engineering Calculations, the LWMS prevails. Landscape Masterplan and Concept plans are also included for reference. The calculations are summarised in **Table 3 overleaf**.

TABLE 3 – POS Calculations

POS Ref	POS Area	1yr (m ²)	5yr (m ²)	Deduction	Restricted POS (m ²)	Unrestricted POS (m ²)
A	5650m ²	N1: 1000	N1: 1030	1760	30	3860
		N2: 760	N2: 760	-	-	-
B	2725m ²	-	-	-	-	2725
C	1833m ²	-	-	-	-	1833
D	5120m ²	1392	1447	1392	55	3673
E	2500m ²	S2: 800	800	800	-	1700
F	1275m ²	-	-	-	-	1275
G	4430m ²	S4: 760	760	760	-	3670
Total				4712	85	18 736

Based on the above POS schedule, 99.5% of the required POS has been provided as unrestricted POS. The distribution and credits for POS within the Structure Plan area are illustrated on the Public Open Space Plan which is also included at **Appendix 5**.

TABLE 4 – POS Schedule (All areas in hectares)

NET SITE AREA	19.4292
Deductions	
1:1 yr Drainage Swales	0.4712
Lake Road widening	0.1452
Gross Subdivisible Area	18.8128
Required Public Open Space @ 10%	1.8813
Public Open Space Contribution	
To comprise:	
• minimum 80% permissible Unrestricted Public Open Space	1.505
• maximum 20% permissible Restricted Public Open Space	0.3763
Public Open Space Provided	
Drainage Swales: 1:5yr outside 1:1yr areas	0.0085
Unrestricted POS contribution PROVIDED	1.8736 (99.5%)
Restricted POS PROVIDED	0.0085 (0.5%)
TOTAL PUBLIC OPEN SPACE PROVIDED	1.8821

3.3 Residential

3.3.1 Land use and residential density

The Structure Plan has regard for the progressive residential development occurring to the north-east of the Structure Plan area, the established residential development to the east of Lake Road and the proposed residential subdivision and development to the north of the Structure Plan within the Precinct B Structure Plan area.

The proposed residential density is consistent with the strategic direction of the Sub-Regional Planning Framework which promotes higher densities in undeveloped areas zoned for urban use, particularly in areas close to transit corridors and high amenity. The Sub-Regional Planning Frameworks encourage new urban development to use an average residential density target of 15 dwellings per gross hectare of urban zoned land and 26 dwellings per residential site hectare to guide the allocation of residential densities.

Given the site benefits from high amenity due to its proximity to the Wungong River, the Structure Plan is proposed for residential development at a density coding of R25 and R40. This achieves an appropriate residential density in an area of high amenity of 30.5 dwellings per site hectare. Based on 2011 ABS statistics and an expected dwelling yield of 336 dwellings, the estimated population of the Structure Plan area is 873 persons at 2.6 persons per dwelling. A Lot Layout and Yield Plan is included as **Appendix 6**.

3.3.2 Residential lot layout and orientation

The road network has been designed to facilitate the creation of regular shaped lots, capable of accommodating standard residential dwellings, with direct access to a public street. A suitable mix of lot types are proposed, including a standard 12.5m x 28m R25 product and 8m x 30m rear loaded R40 product. Due to the typical depth of the R25 lots, a reduced (4m) front setback is proposed. SA 81 introduced of a minimum 4m primary street dwelling setback via Schedule 8 of TPS4 for all lots with R25 density coding within the precinct.

The proposed local road network predominately consists of east-west road connections, to maximise single residential lots oriented north-south, providing opportunity for solar passive design.

The orientation of lots fronting the Wungong River foreshore and integrated POS areas (POS Areas A, B, E, F and G) shall ensure a high level of passive surveillance to all POS. Similarly, lots shall be orientated to address the POS areas fronting Lake Road (POS Areas C and D). With regard to the residential lot interface at the southern intersection and Lake Road with POS Area G, a suitable interface treatment could be achieved by requiring a habitable room window and visually permeable fencing along a portion of the south western lot boundary via an LDP. An LDP could also be required to a similar effect for lots adjacent to the 8m wide PAW.

A north-south road adjacent to the western boundary of the Structure Plan area shall be provided along the Wungong River foreshore. All lots fronting the Wungong River foreshore are serviced via rear laneways providing slightly elevated lots.

Due to access constraints, a single battle-axe lot to the north-east of the Structure Plan area (adjacent to the Poad Street roundabout) is proposed.

3.3.3 Residential Lot Size

The Structure Plan proposes a road network that results in the creation of standard street blocks that are robust and adaptable to accommodate a variety of lot sizes. Density codings of R25 and R40 are proposed. Standard R25 coded lots would be 350m² in area, with standard R40 lots being 240m² in area.

3.4 Movement Networks

3.4.1 Existing movement network

Regional Road Network

The subject site is well connected to the metropolitan and wider regional road network, given its close proximity to the Tonkin Highway, Ranford Road and Armadale Road. The regional road network provides efficient access to the wider Perth Metropolitan Region including commercial and employment centres.

Lake Road, at the south-eastern boundary of the subject land, is designated as an Other Regional Road under the Metropolitan Region Scheme (MRS). Lake Road performs a higher order road function, providing access from Ranford Road and Armadale Road to Albany Highway as an alternative to the Tonkin Highway.

Local Road Network

The subject land has direct frontage to Lake Road, an Other Regional Road that currently connects to the Primary Regional Road network. Poad Street runs along the north-eastern boundary of the subject land and terminates adjacent to the Wungong River foreshore.

Public Transport Network

The site is well located with respect to existing public transport, located 2.8km from Sherwood train station along the Armadale train line. Transperth operates the Perth to Armadale passenger rail service seven days a week. The service operates:

- Monday to Friday from 5.11am to 12:39am;
- Saturday from 5.16am to 2:54am; and
- Sundays & Public Holidays from 7:16am to 12.39am.

Bus routes linking the subject land to the rail system will ensure that future residents have convenient access to an efficient public transportation network. The nearest bus stop is located along route no. 245 and is 50m south of the subject land. Bus 245 is a high frequency bus route operating Monday to Friday from 5:55am to 9:32pm, on Saturday from 7:53am to 9:32pm and on Sunday and Public Holidays from 7:53am to 7:22pm. The bus services both Armadale and Kelmscott train stations.

Cycle Network

The subject land is located within close proximity to the Perth Bicycle Network including a shared path along Lake Road, bicycle lanes along Ranford Road and Armadale Road, and a Principal Shared Path along the Tonkin Highway.

The Principal Shared Path connects the site with destinations along the north-south length of the Tonkin Freeway, stretching from Thomas Road to Mills Road and intersecting with the Principal Shared Path alongside Albany Highway.

The Structure Plan will be designed to encourage cycling through the provision of a dual use path network, connecting to the existing external footpath network. The dual use path will generally follow Wungong Brook, linking to Lake Road, Poad Street and the internal proposed road network.

Pedestrian Network

The progressive development of the area will facilitate the provision of a significantly upgraded pedestrian network. Future subdivision within Precinct A1 will facilitate the provision of a highly connected network of shared paths and pedestrian paths linking the Wungong River parkland to Lake Road, Poad Street, and the existing surrounding footpath network.

3.4.2 Proposed movement network

The Transport Impact Assessment (July 2017) at **Appendix 7** provides support for the Structure Plan and responds to comments by the City of Armadale, Department of Planning and Department of Transport during the statutory advertising period.

Vehicular access/egress to the will be via four (4) intersections to Lake Road. The existing four-way intersection of Lake Road/Poad Street will be upgraded and constructed with a roundabout to enable full movement access. The timing of the roundabout construction can be addressed via a condition of subdivision approval. The northern-central and southern-central intersections will be restricted to permit only left-in/left-out movements only. The southern intersection will enable full vehicle movement.

Transcore has reviewed comments from the City of Armadale Technical Services department in relation to the location and function of the southern and southern-central intersections. The centreline to centreline distance between the proposed southern-central intersection on Lake Road and the existing southern full-movement service station access is estimated to be approximately 130m. The existing right-turn pocket on Lake Road for the service station access is approximately 80m long (inclusive of the taper). With the existing 6m wide median on Lake Road, this leaves only 50-60m to accommodate the required right-turn pocket for the proposed southern-central intersection. However, based on Austroads warrants for the 70km/h speed limit, the required length of the right-turn pocket is 70 – 100m subject to adopted rates of deceleration.

Accordingly, the proposed southern-central intersection does not lend itself to a full-movement intersection. It was therefore recommended by Transcore that the format of northern-central intersection (left-in/left-out), southern-central intersection (left-in/left-out) and southern intersection (full-movement) as well as full-movement access at Poad Street intersection be provided.

In its comments on the advertised Structure Plan, the Department of Planning recommended the length of the R25 coded street block along the southern length of Lake Road be reduced in accordance with Liveable Neighbourhoods (Element 2, R13). The Structure Plan design has responded by introducing a PAW at a midpoint of the block resulting in the street block comprising two separate lengths of 130m and 140m respectively. The PAW will be 8m in width, is straight with a length of only 28m and adjoining lots could, if required, be subject to an LDP requirement. Accordingly, the design of the PAW will satisfy 'designing out crime' principles. A Landscape Concept for the PAW has been prepared and is attached at **Appendix 5**.

The PAW will also provide a connection to a future external pedestrian crossing over Lake Road, consistent with the Department of Transport's recommendation to secure the most

direct access to the nearest primary school and bus routes via a crossing at this location as part of a safe walk/cycle to school initiative. Further, the PAW will enable sewer pipework to be extended from Lake Road to service the Structure Plan Area. Therefore, the proposed intersection arrangement is considered to be optimal in terms of facilitating safe and efficient vehicular and pedestrian access.

The proposed internal road network consists of a majority north-west to south-east road linkages, with some north-east to south-west road linkages and fourteen (14) laneways. All internal roads can be classified as *Access Street C* and *Laneway* according to Liveable Neighbourhoods principles.

Access Street C is a typical residential street projected to carry up to 3,000vpd and a road reserve of 15.4-16m with 7.2m trafficable carriageway. If fronting POS, the road reserve width may be reduced to 14.2m. Road reserves of 15.4m and 14.2m adjacent to POS are provided throughout the Structure Plan. A short section of service road adjacent to Lake Road in the northern part of the Structure Plan area is provided with a 13m wide reserve.

The typical road reserve for *Laneways* entails a 6m wide trafficable pavement sufficient to allow two-way movements, rubbish collection and vehicle access into garages located on the rear of properties. Maximum desirable traffic volume for a laneway is 300vpd. Visitor parking for rear loaded lots in the Structure Plan are recommended to be provided within the verge of the *Access Streets'* frontage.

The proposed Structure Plan pedestrian path system shall be designed so as to seamlessly integrate with the existing external path system along Lake Road. As such, pedestrian paths on one side of all *Access Streets* within the Structure Plan are proposed.

Internal subdivisional roads will be constructed to City of Armadale specifications, including kerbing and piped drainage and provision of footpaths as required.

3.4.3 Traffic generation

In calculating trip generation and distribution within the Structure Plan, the Transport Assessment uses a daily traffic generation rate of 8 vehicle trips per day (vpd) per dwelling as recommended in the WAPC *Transport Assessment Guidelines for Development (2006)*. Based on this rate, the proposed Structure Plan will generate approximately 2,800 vpd which can be accommodated by the proposed internal road network.

The traffic projections for the post-development stage indicate that Lake Road would ultimately carry between 12,000-17,000vpd of total daily traffic volumes of which up to 8.6% would be generated by the proposed Structure Plan. The projected 2031 daily traffic volumes are considered to be well within the physical capacity of Lake Road.

The anticipated total daily traffic volume on Poad Street (western section) of around 120vpd is significantly below the future Poad Street carriageway standard designed to carry up to 3,000vpd.

It is therefore concluded that the existing and proposed upgraded road network abutting the Structure Plan has the capacity to accommodate the anticipated traffic generated by the Structure Plan.

3.5 Water Management

The WAPC's Better Urban Water Management (BUWM) document identifies the requirement to prepare a Local Water Management Strategy (LWMS) to support a proposed Structure Plan. The LWMS has been prepared to support the proposed Local Scheme Amendment

and Structure Plan in accordance with the requirements of the BUWM. The LWMS outlines the key elements required to achieve best practice stormwater management for the site and describes the existing hydrological environment including the shallow water table, the western portion of the subject land being within the flood fringe of the Wungong River, local surface runoff, and the existence of an open drain running through the middle of the subject land serving Seville Grove residences to the east.

The LWMS identifies how the Structure Plan supports water sensitive urban design, including non-structural and structural controls to reduce nutrients to Wungong brook from the subject land. The LWMS presents the management strategy for groundwater, surface water, and water use. The LWMS:

- Describes the predevelopment environment;
- Sets out a Local Water Management Strategy for the precinct, including details relating to:
 - (a) Water Use and sustainability initiatives;
 - (b) Surface Water Management;
 - (c) Groundwater Management;
 - (d) Wetland Management;
 - (e) Water Quality Management; and
 - (f) Construction Management.
- Describes implementation of the LWMS including requirements for subsequent investigations (i.e. Urban Water Management Plan).

The development is divided into two major stormwater catchments, containing several minor catchments, particularly within the southern half. Stormwater from these catchments will be treated and discharged into the Wungong River. The stormwater strategy is to attenuate the 1, 5 and 100yr ARI post-development flows from the subject land to pre-development rates, in a series of bio-retention basins in POS areas. Finished floor levels will be minimum 0.5m above adjacent 100yr ARI designated flood level in Wungong River. POS irrigation water resource is likely to be from superficial aquifer bores.

Flows from the external Seville Grove catchment will be treated within a bio-retention basin located in POS area D, adjacent to Lake Road. Stormwater will then be conveyed via a piped system prior to discharge via an outlet into the Wungong River.

The Department of Water previously advised its preference is for the surface drain traversing the Structure Plan area to be retained. However, the design team in consultation with the City of Armadale have concluded that piping this stormwater flow along the majority of its length is a superior option, having regard to planning design, environmental, engineering and land use efficiency objectives. The environmental benefits of piping the drain are summarised below and are further detailed in the Environmental Report at **Appendix 2**:

- The surface drain has no significant environmental values;
- Findings from previous chemical analysis has shown that flow through the drain caused a distinct reduction in water quality; and
- A bioretention basin is to be constructed which would improve stormwater quality compared to the existing surface drain

The proposed piping of the drainage would better manage the Seville Grove stormwater flows and thus should be supported by the Department of Water, rather than the existing surface drain being retained.

At the present time drainage from the site is unmanaged and the land use is effectively agricultural. As a result it is reasonable to conclude that there will be some nutrient export from the land into the Wungong River. The transition in land use from agricultural to urban and the establishment of urban water management in accordance with better urban water management principles including nutrient export control, will result in an improvement in nutrient discharges to the Wungong River.

The LWMS groundwater strategy includes subsoil drains to control groundwater levels, and subsoil treatment in bio-retention basins or swales prior to discharge. Due to fill being required to provide enough separation to groundwater, site soakage is proposed for all lots greater than 300m² in area. Smaller lots will have a connection to the stormwater system.

All stormwater drainage design and construction will be completed to the City of Armadale specifications and in accordance with any future approvals.

3.6 Education Facilities

Willandra Primary School is located 550m south-east and Cecil Andrews Senior High School is located 1.1km east of the subject land. Challis Primary School and Early Childhood Education Centre are co-located 1.8km west of the subject land.

3.7 Activity Centres and Employment

The subject land is located approximately 3.8km from both Armadale and Kelmscott District Centres and 2km east of a range of existing retail and community facilities including the Champion Drive and Westfield Local Shopping Centres.

The Kelmscott Industrial Area located on Champion Drive is 2km east of the subject land and offers a range of employment opportunities at a local and regional level.

The Forrestdale Business Park is located between Ranford Road and Armadale Road, and adjacent to the Tonkin Highway, approximately 250m south of the subject land. The Business Park covers 190 hectares and accommodates up to 700 industrial lots, with potential to ultimately create more than 12,000 jobs.

Regional employment opportunities in the commerce, retail and service sectors are located within relatively close proximity at Armadale and Kelmscott.

3.8 Infrastructure Coordination, Servicing and Staging

3.8.1 Servicing

Development Engineering Consultants have prepared an Engineering Services Report, a copy of which is attached as **Appendix 8**. Details of service infrastructure available to the site are included below:

Power Supply

Sufficient power supply exists in the area to supply the development. High and low voltage aerial power lines are located on sections of both Lake Road and Poad Street. The existing dwellings along Lake Road are served from these sections.

Lake Road has light poles installed and are connected via underground cable. A Transmission high voltage aerial line is located within the Lake Road reserve at the corner of Henderson Drive at the southern end of the site.

It is expected that the subdivision will be serviced from the mains at the corner of Lake Road and Henderson Drive. Transformer sites will be determined at the detailed subdivision design stage.

Water Supply

Currently there is a 150mm water main along Poad Street connecting across Lake Road, and small 100mm mains within the Lake Road reserve servicing the existing dwellings on the subject land.

There is a 250mm water main within Lake Road opposite Henderson Drive, which can be extended along Lake Road into the subdivision. The Water Corporation has also advised that as a result of development along Lake Road north of the subject land, upgrades to water supply infrastructure may be required.

Reticulated Sewer

The site is not currently connected to sewer. Water Corporation sewer infrastructure exists on both the southern and northern extents of the site.

The Water Corporation has advised that the site falls into two sewer catchments. The southern part is to be connected to the Lake Road Waste Water Pump Station (WWPS), which is located on the east side of Lake Rd at the corner of Henderson Drive, via the existing sewer located on the eastern verge of Lake Road. This will require extending the connecting sewer across Lake Road.

The Corporation also advises that the northern part of the development is to be connected to the McNeil Road WWPS, which is located in McNeil Road some 400m north of Poad Street. The extension of the sewer to the site will entail constructing a sewer along an unmade road reserve (previously part of Lake Road) and also a crossing of the Williams Road Main Drain, which is an open channel drain under the control of the Corporation.

Earthworks and Retaining Walls

The subject land slopes west from Lake Road to the Wungong River. The finished site levels will be controlled by the sewer levels and thus fill will result in the land sloping generally east towards Lake Road. Low retaining walls will be installed as necessary to provide level lots with appropriate road access. All retaining walls will be subject to building approval from the City.

Detailed engineering design has been undertaken to demonstrate how development of the site will be integrated with levels surrounding land, including the interface with the Wungong River. Sections are included at **Appendix 5**.

The internal roads will be lifted, with imported clean sand fill as required, above Natural Surface Level to provide cover to the sewer and access to lots which require filling for the required clearance to groundwater.

Telecommunications

Telstra services exist in the area along both Lake Road and Poad Street adjacent to the site. These are not currently capable of servicing the future subdivision of the land facilitated by this proposal, so some upgrading will be required. Telstra generally requires twelve months' notice of development to ascertain any upgrading requirements.

NBN services are installed east of Lake Road opposite McNeil Road. In accordance with statutory requirements for subdivisions of more than 100 lots, the developer is required to install NBN "pipe and pit" to allow for future installation of cables for the NBN. The design of the "pipe & pit" is the responsibility of the developer, and will be designed in conjunction with the underground power network, and installed during the construction phase of the subdivision.

Gas

ATCO has advised that gas mains are located in the vicinity of the subject land within the existing residential development on the eastern side of Lake Road and also along Poad Street.

It is likely that gas mains will be installed in the customary way with the developer providing the trench, and ATCO installing the conduits and other infrastructure.

3.8.2 Staging

Construction of the Poad Street/Lake Road roundabout shall occur prior to any subdivision or development in Development Area 48 taking vehicle access to/from Poad Street.

Other than the upgrading of the Poad Street/Lake Road intersection, there are no infrastructure triggers which shall influence the staging of future subdivision within Development Area 48.

3.9 Developer Contribution Arrangements

Part 6B – Development Contributions Areas of TPS 4 provides for a cost contribution scheme to be established, to ensure the equitable sharing of costs between owners towards infrastructure required as a result of the subdivision and development of land within the Developer Contribution Area (DCA). It is not anticipated the subject land will be included within a DCA.

3.10 Other Requirements

3.10.1 Bushfire management

The Structure Plan design has been prepared having regard to the requirements of the Bushfire Management Plan at **Appendix 4**, which in turn has been informed by a Foreshore Management Plan (**Appendix 9**) and comments provided by DFES in response to statutory advertising.

The Bushfire Management Plan complies with SPP 3.7 – *Planning in Bushfire Prone Areas* and the associated Guidelines. Relevant bushfire considerations and compliance statements which demonstrate how the various bushfire protection criteria are satisfied by the Bushfire Management Plan are discussed below.

Location

The proposed subdivision and development is located in an area where the bushfire hazard level is currently moderate or extreme (adjacent to the forest area), and the bushfire attack level is assessed variously as BAL-LOW, BAL-12.5 and BAL-19 on the proposed lots. The area within the development site and surrounding the proposed dwellings will be cleared and there may be retention of a portion of the sparse tree overstorey.

Siting and design of Development

A suitable setback from habitable buildings to classified vegetation or revegetation within the Wungong River Reserve is required to achieve a suitable BAL rating. The setback will consist of a 16.5 metre road reserve and landscape zone within the Wungong River Reserve (including a 4 metre wide dual use pathway) and a minimum appropriate setback in the front of the lot to achieve the nominated BAL rating. The 4 metre wide dual use pathway (DUP) will consist of a 2 metre wide path with 1 metre wide shoulders either side of the path consisting of minimum of 100mm compacted road base material. This will then provide a pathway and access for fire appliances (up to 15 tonnes) and maintenance vehicles in the POS area. Trees should be planted a minimum of 6 metres from the centre of the DUP. The 16.5m road reserve and landscape zone will be required to be managed to the Asset Protection Zone or 'low threat vegetation' standard. This can be achieved by ensuring the appropriate species and separation distances between plants are selected (and maintained).

POS areas will comply with the Asset Protection Zone or 'low threat vegetation' standard.

The area adjoining the Structure Plan to the north of Poad Street between Lake Rd and the Wungong River is zoned Urban under the MRS and is subject to future residential subdivision and development. However, it is not known when this will occur. The lots adjoining Poad Street (within the relevant vegetation assessment zone distance) will be constructed to the appropriate BAL rating applicable for that vegetation classification. It is recommended that all proposed habitable buildings within 100 metres of this vegetation have the BAL re-assessed at Building Permit application stage to ensure any changes to

the vegetation are considered when determining the actual BAL rating for the proposed dwelling.

The Structure Plan is located in an area that will progressively be subject to urban subdivision and development.

When constructed, all dwellings will be at a maximum BAL rating of BAL-19. The majority of the lots are rated BAL-LOW with those located closer to vegetation being rated as BAL-12.5 or BAL-19.

The design of the development has ensured that the roads, paths and infrastructure (such as water supply) is appropriate to the bushfire threat and minimises the potential bushfire risk to people, property and infrastructure. The landscaping associated with the development has been designed to not increase the bushfire risk.

Vehicular Access

The Structure Plan Area is serviced by a major public road, being Lake Road. Access into individual lots will be via crossovers from an internal road network constructed as part of the subdivision. These subdivisional roads, shall provide suitable access for emergency, public and private vehicles. There are number of alternative access routes within the internal road network which will facilitate movement to Lake Road, which in turn provides for two alternative directions of travel.

Water

The subdivision will be connected to the reticulated scheme water system. Mains water will be available in accordance with the Water Corporation and DFES specifications.

In accordance with Scheme requirements introduced as part of SA 81, the Bushfire Management Plan will be approved prior to approval of the Structure Plan and implemented as a condition of subdivision approval. It will be the responsibility of the developer to implement the provisions of the Bushfire Management Plan in order to seek clearance of relevant conditions of subdivision. Likewise it is the responsibility of the City of Armadale to ensure that all standards required in this Bushfire Management Plan are met by the developer prior to clearing any conditions of subdivision relating to this Bushfire Management Plan.

3.10.2 Environmental Management

The Environmental Report at **Appendix 2** concludes following desktop survey and site investigations conducted between October 2014 and March 2015, that there are no constraints to development of the Structure Plan area derived from the environmental characteristics of the land. This conclusion reflects the current condition of the Structure Plan area being completely cleared of native vegetation in the past.

A Landscape Masterplan has been developed based on the Structure Plan design and is included as Figure 7 within the Environmental Report. The Landscape Masterplan provides for the retention of significant trees contained within POS areas. A Foreshore Management Plan has also been prepared (**Appendix 9**), which proposes the establishment of new plantings of fringing vegetation at the margins of the Wungong River, grassed open space, fire buffer garden beds with low fuel native plants, and dual use pedestrian path/fire access tracks. Replanting within the Wungong River Parks and Recreation reserve with native plants will constitute an increase in the area of the locality which is vegetated by native flora and will increase the available habitats at the fringe of the Wungong River.

The Foreshore Management Plan accords with the provisions of the Wungong Brook Management Plan 2010 to 2015 and advice from the City of Armadale environmental officers. A detailed landscape plan for this area is anticipated as a condition of subdivision approval and will be developed at that time.

The hydrological connection between the land and the adjacent Wungong River is the most significant environmental factor associated with the subdivision and development of the Structure Plan area. Thus, the focus of environmental management to support development of the land will be through the establishment of an Urban Water Management Plan for the land as detailed in the LWMS prepared by JDA Consultant Hydrologists.

Groundwater monitoring at twelve (12) bore locations across the Structure Plan area was conducted by Bowman and Partners Environmental four times between 27 October 2014 and 29 January 2015. Further monitoring of groundwater levels and groundwater quality was subsequently undertaken such that the 2015 peak groundwater levels were also captured.

3.11 Implementation

The proposed Structure Plan has been prepared in accordance with the requirements of the Planning and Development (Local Planning Schemes) Regulations 2015. Further, the Structure Plan complies with the applicable State and Local Planning Policy Framework as set out in section 1.3 of this Report.

The Planning and Development (Local Planning Schemes) Regulations 2015 stipulate the manner by which the Structure Plan will be processed by the City of Armadale and thereafter, the Western Australian Planning Commission to enable final approval.

Following adoption of the Structure Plan, Development and Subdivision Applications can be considered and approved where they comply with the Structure Plan.

TECHNICAL APPENDICES INDEX

Appendix No.	Nature of Document	Assessment Agency	Approval Status
1	Certificates of Title	N/A	N/A
2	Environmental Report	LA	N/A
3	Bore Location Plan	N/A	N/A
4	Bushfire Management Plan	LA/DFES	Approved (DFES July 2018)
5a	Table 12 and Figure 11 Extracts from LWMS	LA/DoW	For Assessment (LWMS)
5b	Engineering Plans	LA	For Information
5c	Landscape Masterplans and Concept Plans	LA	For Information
5d	Public Open Space Plan	LA/WAPC	For Information
6	Lot Layout and Yield Plan	N/A	For Information
7	Transport Impact Assessment	LA	For Assessment
8	Engineering Report	N/A	For Information
9	Foreshore Management Plan	LA	For Information

Abbreviations:

LA: Local Authority

WAPC: Western Australian Planning Commission

DoW: Department of Water

DFES: Department of Fire and Emergency Services