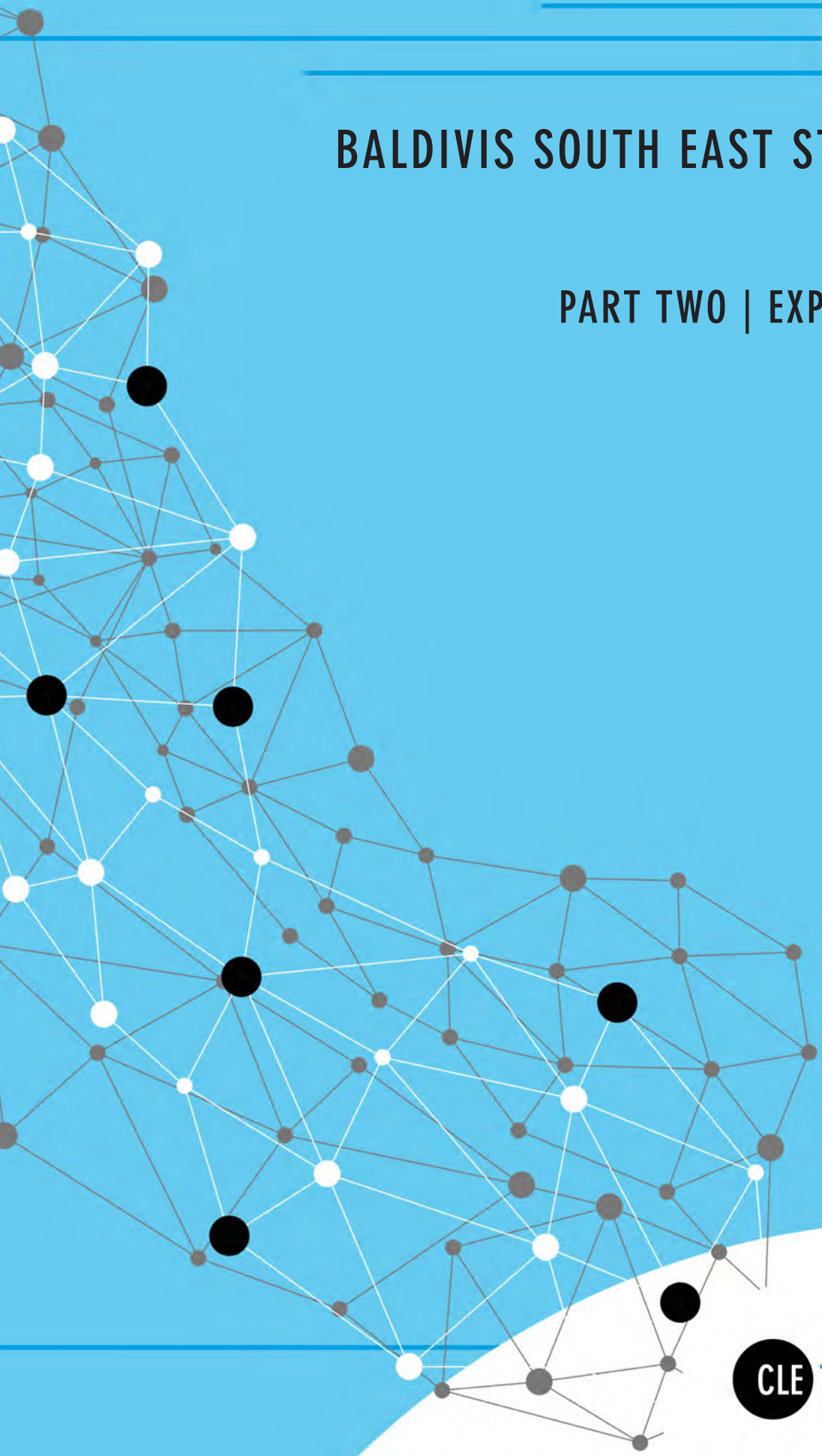
# BALDIVIS SOUTH EAST STRUCTURE PLAN

## PART TWO | EXPLANATORY REPORT

October 2020



PARCEL

CLE Town Planning + Design
www.cleplan.com.au

| | |
|---|---|
| Title: | Baldivis South East Structure Plan<br>Part Two Explanatory Report |
| Prepared for: | KEC Nominees Pty Ltd |
| CLE Reference: | 3407Rep50C |
| Date: | 21 October 2020 |
| Status: | Final |
| Review date: | 21 October 2002 |
| Prepared by: | CLE Town Planning + Design |
| Project team: | Developer - Parcel Property<br>Town Planning & Urban Design - CLE Town Planning + Design<br>Environmental - 360 Environmental<br>Hydrology - Urbaqua<br>Traffic - KCTT<br>Engineering - Pritchard Francis Engineering Consultants<br>Bushfire - Eco Logical Australia<br>Acoustics - Herring Storer Acoustics<br>Landscape - LD Total |

This report is for the exclusive use of the Client, pursuant to Agreement between the Client and CLE Town Planning + Design. CLE accepts no liability or responsibility whatsoever in respect of any use of or reliance upon any information contained within this report by anyone who is not party to the Agreement and/or has come into possession of the Report through parties other than the Client or CLE.

CLE is not accountable for any information which may be contained within the Report which has been supplied by others and reproduced by CLE in this report.

Copyright and any other Intellectual Property arising from this report and the provision of the services in accordance with the Agreement belongs exclusively to CLE unless otherwise agreed and may not be reproduced or disclosed to any other person other than the Client without the express written authority of CLE.

Any reproduction by the Client is to reference CLE as the original author.

Plans and figures contained in this report have been prepared for general information purposes only and may inadvertently use uncontrolled data from external sources. CLE does not guarantee the accuracy of the plans and they should not be used for any detailed site design. The content of this report including all plans remains the property of CLE.

© CLE 2020

# Table of Contents



# Figures



# Appendices

# 1.0 Planning Background

## 1.1 Introduction and Purpose

The Baldivis South East Structure Plan (the Structure Plan) has been prepared on behalf of KEC Nominees Pty Ltd and relates to Lots 1006, 1007 and 1272 Baldivis Road, Lot 1 Serpentine Road and Lot 503 (of no street address), Baldivis. The Structure Plan is lodged in accordance with the City of Rockingham Local Planning Scheme No. 2 which requires a structure plan for land zoned 'Development'.

The purpose of the Structure Plan is to provide a planning framework to guide future subdivision and development and is consistent with the recommendations of Perth and Peel@3.5million and the Sub Regional Planning Framework.

The format of the Structure Plan follows that set out in the Western Australian Planning Commission's (WAPC) Structure Plan Framework, comprising three parts:

**Part 1 Implementation:** Contains the Structure Plan map and outlines the requirements that will be applied when assessing subdivision and development applications.

**Part 2 Explanatory Section:** Discusses the key outcomes and planning implications of the background and technical reports and describes the broad vision and more detailed planning framework being proposed. Part 2 is based on a detailed site specific analysis of opportunities and constraints and the following technical reports and strategies:

- Environmental Assessment Report (360 Environmental);
- Bushfire Management Plan (EcoLogical Australia);
- Local Water Management Strategy (Urbaqua);
- Transport Impact Assessment (KCTT);
- Road Traffic Acoustic Assessment (Herring Storer);
- Engineering Servicing Report (Pritchard Francis Engineers); and
- Landscape Masterplan (LD Total).

**Technical Appendices:** Includes the technical reports and supporting plans and maps as prepared by the technical consultants in support of the proposal.

## 1.2 Land Description

The following section provides a brief summary of the location, land use and ownership within the Structure Plan area.

### 1.2.1 Location

The Structure Plan is located in the City of Rockingham, approximately 11.5km south-east of the Rockingham Strategic Metropolitan Centre and 44km south of the Perth CBD (Figure 1: Location Plan).

The Structure Plan area is generally bound by:

- Serpentine Road to the north;
- Sixty Eight Road to the south;
- Kwinana Freeway to the east; and
- Baldivis Road to the west.

The existing Baldivis Tramway reserve is located in the Baldivis Road reserve, abutting the western edge of the Structure Plan area.

The Structure Plan sits in the south-eastern corner of the Baldivis growth corridor, which is one of the fastest growing residential areas in Australia.

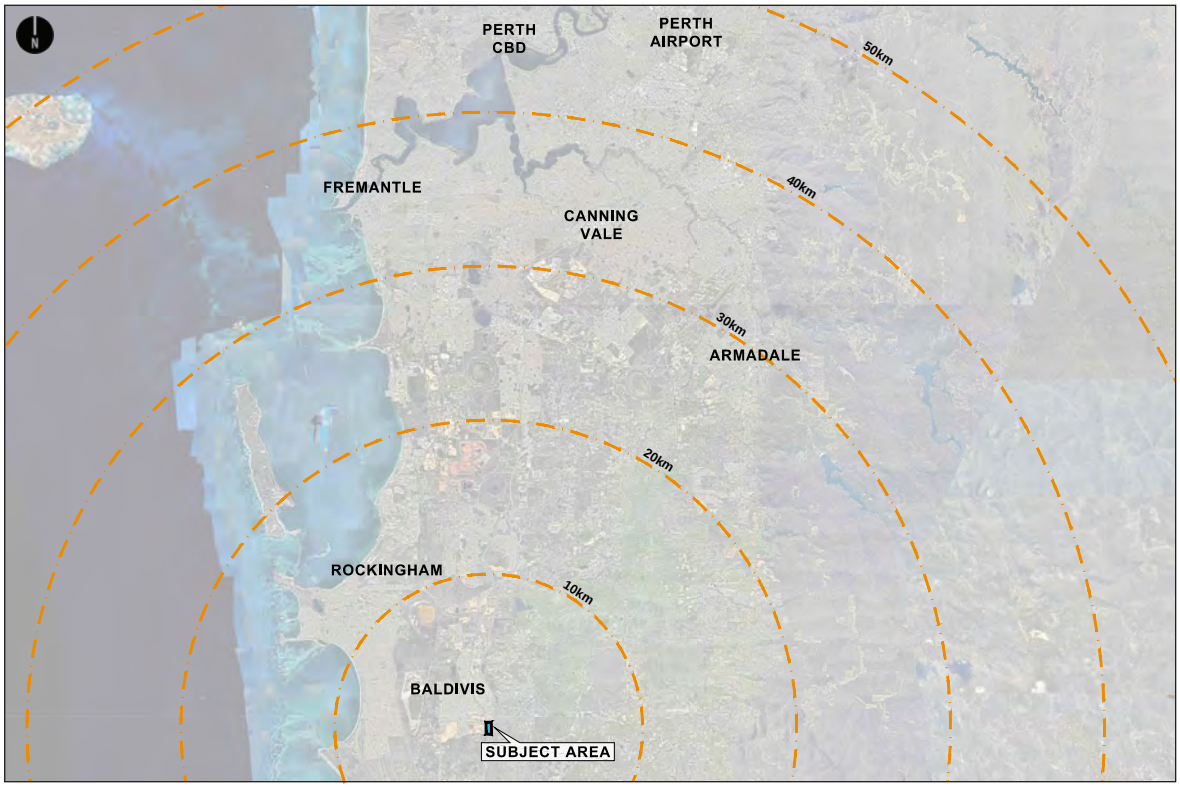



**Figure 1 Location**
*Source: Nearmap*

### 1.2.2 Area and Land Use

The Structure Plan area is 27ha and up until recently was used as rural lifestyle lots for horse agistment (Figure 2: Site Plan).

Past agricultural pursuits have had a considerable impact on the natural environment of the site resulting in extensive clearing of vegetation for livestock grazing and other semi-rural activities. The site connects into the existing road network via Serpentine and Sixty Eight Roads which run along the northern and southern boundaries of the Structure Plan area respectively, both which in turn connect to Baldivis Road. Further access to Baldivis Road is also currently provided, via an informal crossing over the Baldivis Tramway reserve to lot 1006.

### 1.2.3 Ownership and Title Details

This Structure Plan comprises 5 titles. This land is legally described as set out in Table 1.

| Lot Number | Diagram/Plan | Volume | Folio | Owner |
|---|---|---|---|---|
| 1 | D9832 | 1989 | 972 | KEC Nominees Pty Ltd |
| 503 | P50797 | 2862 | 213 | State Planning Commission |
| 1006 | P202754 | 2122 | 32 | KEC Nominees Pty Ltd |
| 1007 | P202754 | 1950 | 287 | KEC Nominees Pty Ltd |
| 1272 | P152973 | 499 | 162A | KEC Nominees Pty Ltd |

KEC Nominees Pty Ltd has a controlling interest over Lots 1, 1272, 1006 and 1007, Baldivis and as the major landowner has prepared this Structure Plan.

### 1.2.4 Surrounding Land Use and Context

The Structure Plan represents the next phase in the consolidation of the Baldivis community with the following a brief summary of the local context:

- The Baldivis Tramway reserve abuts the site to the west, situated within the Baldivis Road reserve.
- The Kwinana Freeway runs along the eastern edge of the Structure Plan area, reserved as 'Primary Regional Roads'.
- Land to the north of Serpentine Road is cleared and under construction as an expansion to the Heritage Park residential estate.
- Land on the southern side of Sixty Eight Road generally consists of a number of private rural-lifestyle lots.
- The 'Brightwood' residential estate exists to the western side Baldivis Road.
- The Parmelia Gas Pipeline, being a high pressure gas main, passes across the southern portion of the Structure Plan area.
- Rockingham Strategic Metropolitan Centre (11.5km to the north-west) and the Baldivis District Centre (3km north along Safety Bay Road) are located in proximity to the Structure Plan, offering employment opportunities and access to retail, commercial and community services.
- A small neighbourhood centre and a local centre are planned for in the South Baldivis District Structure Plan, located north and west of the Structure Plan area respectively, adding local convenience for future residents.

The local context showing as Figure 3: Local Context Plan.


**Figure 2 Site Plan**
*Source: Nearmap*

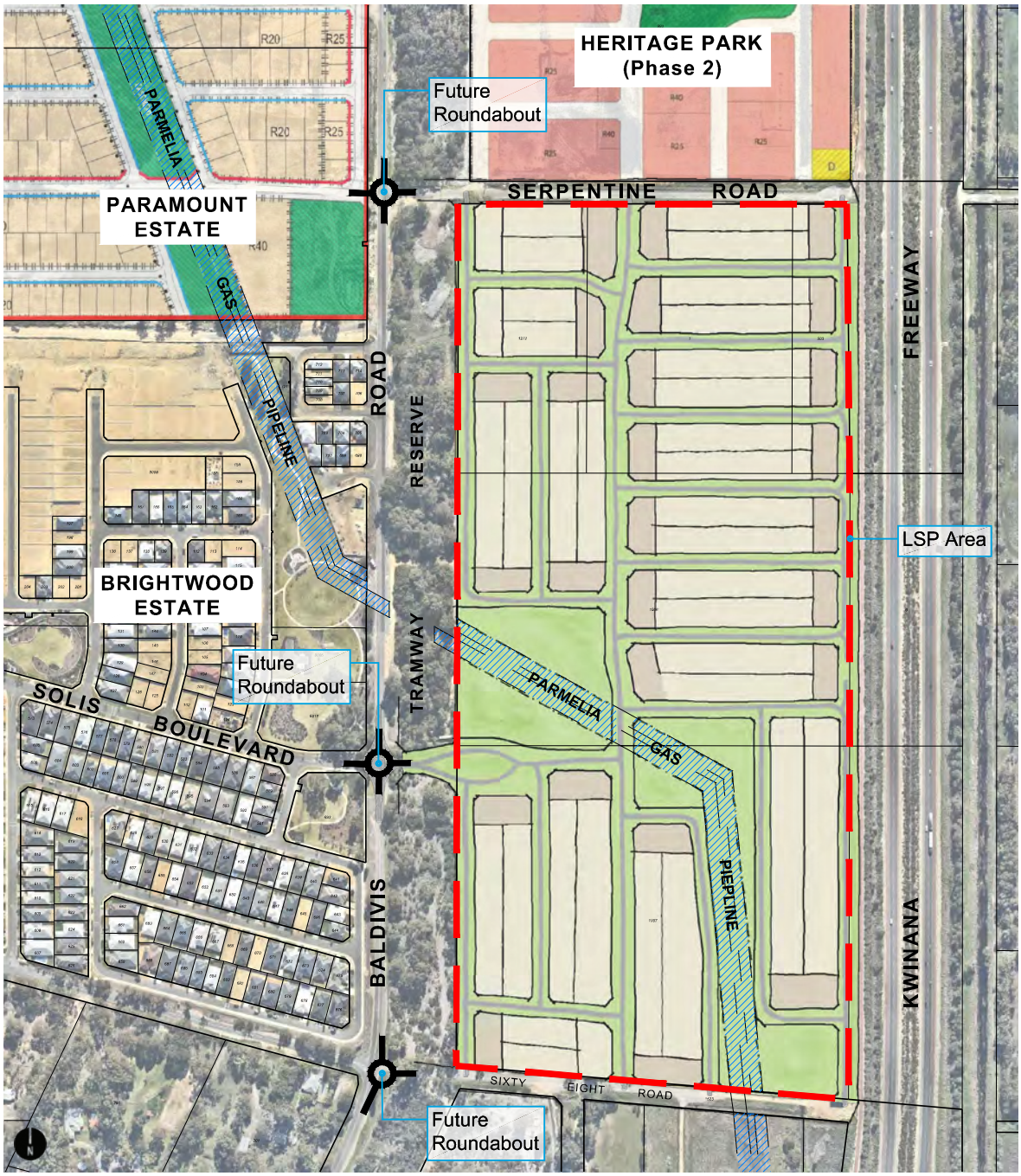



**Figure 3 Local Context Plan**
*Source: City of Rockingham / Creative Design & Planning / Nearmap*

## 1.3 Planning Framework

### 1.3.1 Metropolitan Region Scheme Zoning

The Structure Plan area is zoned 'Urban' in the Metropolitan Region Scheme (Figure 4: MRS Zoning).

The Kwinana Freeway which runs along the eastern boundary is reserved 'Primary Regional Road' whilst the Baldivis Tramway Reserve abutting the western boundary is reserved 'Parks and Recreation.' The Tramway Reserve is wholly located within the Baldivis Road reservation.

### 1.3.2 City of Rockingham Local Planning Scheme No 2.

The Structure Plan area is zoned 'Development' (Development Area 44) in the City of Rockingham Local Planning Scheme No. 2 (LPS2). Under a 'Development' zone a structure plan is required prior to development and subdivision (Figure 5: LPS2 Zoning).

### 1.3.3 Strategic Planning Framework

*Perth and Peel@3.5million (March 2018)*

Perth and Peel@3.5million is a high level 'spatial framework' and strategic plan that manages the growth of the metropolitan region, and provides a framework to guide the planning and delivery of essential housing, infrastructure and services.

This document identifies the Structure Plan area within the South Metropolitan Peel Sub-region, forecasting this sub-region to experience considerable economic and population growth, more than double from 523,400 people in 2011 to 1.26 million by 2050. It also confirms a residential density target of 26 dwellings per residential site hectare. This is discussed in more detail later in this report.

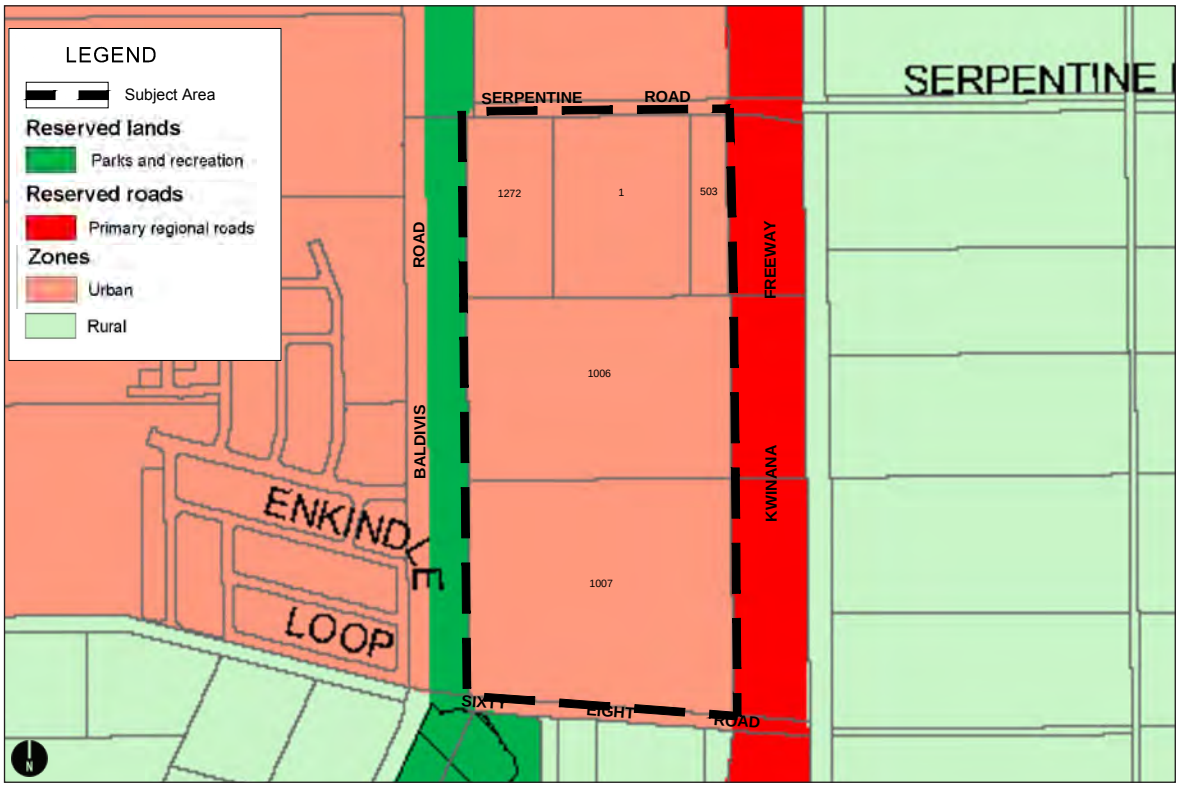



**Figure 4 Metropolitan Region Scheme Zoning**
*Source: WAPC*

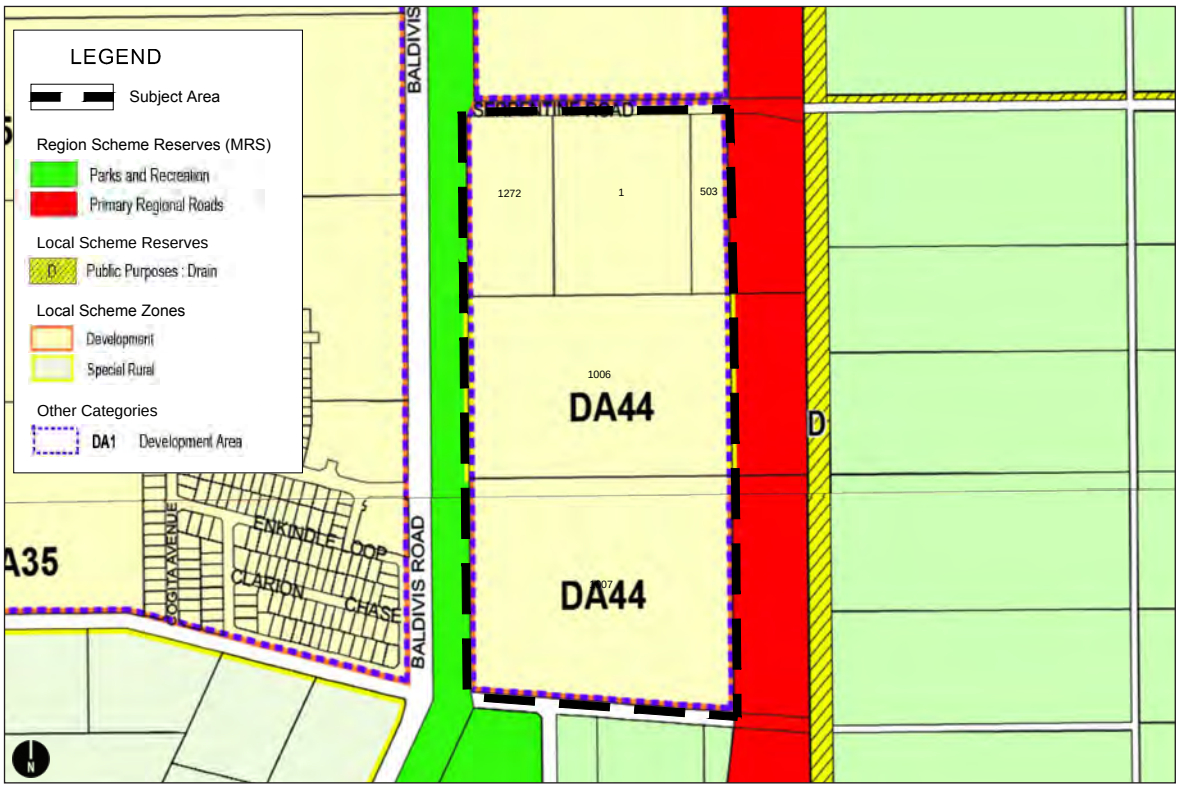



**Figure 5 City of Rockingham Local Planning Scheme No. 2 Zoning**
*Source: WAPC*

*South Metropolitan Peel Sub-regional Planning Framework (March 2018)*

The South Metropolitan Peel Sub-regional Framework (the Framework) provides an additional level of detail regarding the implementation of Perth and Peel@3.5million at the sub regional level. This includes information about the level of expected population growth, servicing and infrastructure, housing demands, and importantly it highlights development opportunities throughout the sub region.

The Structure Plan area has been identified in the Framework as 'Urban', recognising its current zoning under the MRS.

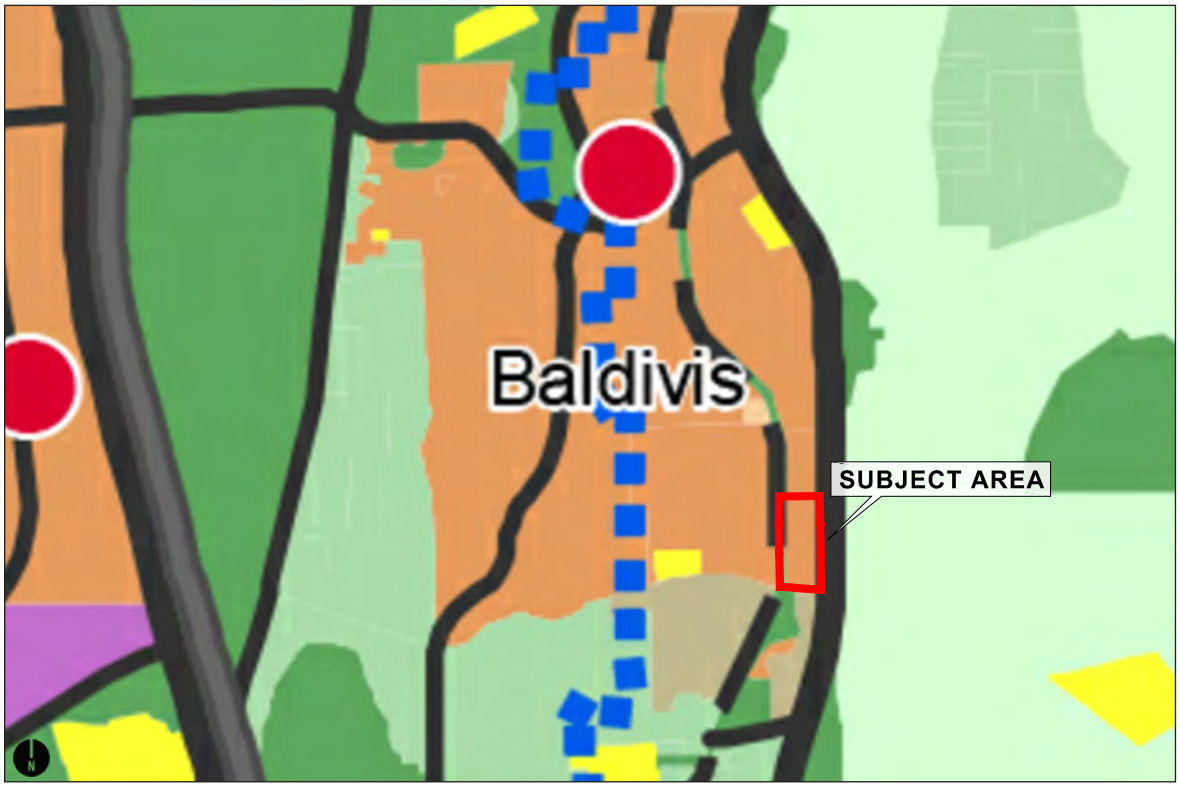



**Figure 6 South Metropolitan Peel Sub-regional Planning Framework (March 2018)**
*Source: WAPC*

*City of Rockingham Urban Growth Programme*

The City of Rockingham Urban Growth Programme was prepared to assist Council in understanding the likely pattern of urban growth within the City of Rockingham, and considered existing population and dwelling statistics, existing structures plans and forecasts future urban growth patterns. The Programme provides the City with a summary of expected urban development areas to help guide Council in its decision making processes.

The Structure Plan falls within Precinct 4 of South Baldivis, identifying this land area as an 'Urban Investigation Area' within the Programme. The Programme explains that these areas were landholdings that were identified as 'Urban Investigation' in the (then) draft South Metropolitan and Peel Sub-Regional Planning Strategy (2015).

The WAPC has since rezoned the Structure Plan area 'Urban' in the Metropolitan Region Scheme (Minor Amendment 1315/57) with the South Metropolitan and Peel Sub-Regional Planning Framework likewise showing the site as 'Urban' reflecting its current zoning (in the MRS).

The Structure Plan therefore fulfils the strategic planning objectives set out in the current strategic planning framework.

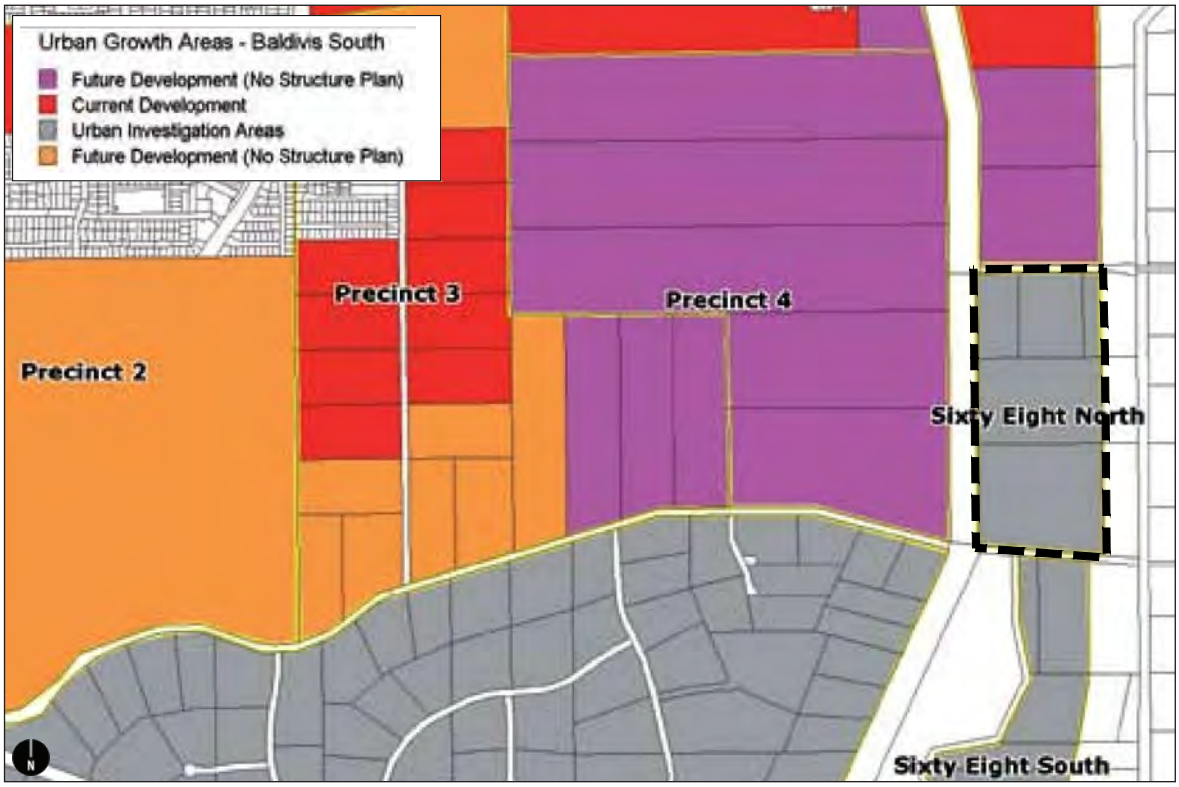



**Figure 7 City of Rockingham Urban Growth Programme**
*Source: City of Rockingham*

### 1.3.4 Other Planning Considerations

The following section summarises other government policies relevant to urbanisation and development of the Structure Plan area.

*WAPC State Planning Policy 3.0: Urban Growth and Settlement*

SPP 3.0 sets out the principles and considerations that guide the location of new urban growth and settlements. It focuses on contiguous expansion of urban areas, consolidation in areas with good access to employment, services and transportation, minimised environmental impact and efficient use of suitable land and infrastructure.

The Structure Plan is consistent with SPP 3.0 as it realises planned urban consolidation within the region. Further the site has excellent access to existing and planned transport networks, employment nodes and activity centres, all in addition to there being no environmental constraints on the site. All essential service infrastructure can be readily and efficiently connected from immediate surrounding areas.

*WAPC State Planning Policy 3.7: Planning in Bushfire Prone Areas*

SPP 3.7 and its Guidelines set out a range of matters that need to be addressed through the planning process to provide an appropriate level of protection of life and property from bushfires.

This Structure Plan is supported by a Bushfire Management Plan (BMP) demonstrating that bushfire risk is not an impediment to the development of the land and that all fire considerations can be appropriately managed in accordance with the Guidelines.

This is discussed in detail in Section 2.6 and 3.4 below and the BMP is attached in full as Appendix 2.

*WAPC State Planning Policy 5.4: Noise and Rail Transport Noise and Freight Considerations*

SPP 5.4 requires consideration of transport noise for sensitive land uses abutting regional transport routes to avoid or mitigate land use conflict between the two.

The Structure Plan abuts Kwinana Freeway, a primary freight route and a traffic route which carries in excess of 20,000 vehicles per day (VPD). As a consequence, a Road Traffic Acoustic Assessment has been undertaken by Herring Storer Acoustics as part of this Structure Plan to assess road noise associated with this key route as set out in SPP 5.4. The assessment concludes that transport noise reaching residential properties could be contained within the thresholds specified by the Policy through the use of interface treatments in accordance with Quiet House Design criteria, and notifications on title to inform future owners of the potential noise impact.

The Road Traffic Acoustic Assessment prepared for the Structure Plan is discussed in further detail in Section 3.6 and attached in full as Appendix 3.

*WAPC Planning Bulletin 87 High Pressure Gas Transmission Pipelines*

The Parmelia Gas Pipeline passes through the Structure Plan area in a north-east direction and is protected by a service easement.

The Structure Plan has been prepared in accordance with the WAPC's Planning Bulletin No.87 High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region which allows for residential development to abut the service easement, with the easement itself integrated within open space. The benefit of this approach is that the pipeline is protected within a valuable community asset that provides excellent local amenity.

A Pipeline Risk Assessment has been prepared by Pipeline Integrity, a result of a workshop attended by Parcel Property, Pritchard Francis Engineers and APA, with this assessment undertaken in accordance with Planning Bulletin 87 and Australian Standard AS2885 Pipelines – Gas and Liquid Petroleum. This Pipeline Risk Assessment was confirmed by the APA Group, being the owner of the Parmelia Gas Pipeline.

The Pipeline Risk Assessment (AS2885 Safety Management Study) is included as Appendix 8, and further discussion regarding the gas pipeline is provided in sections 3.3 and 3.11.

*Liveable Neighbourhoods*

Liveable Neighbourhoods is the WAPC's 'operational policy' for greenfields development in Western Australia. Liveable Neighbourhoods sets out the key considerations for the planning of new communities including subdivision layout and movement networks, the location of open space, community facilities, schools and activity centres.

The Structure Plan has been prepared in accordance with Liveable Neighbourhoods and best practice urban design principles, creating a walkable neighbourhood supported by an interconnected network of local roads and pathways, and adopting an integrated approach to the design of public open space and urban water management. These aspects of the Structure Plan are described in more detail in Section 3.

*Heritage Park Phase Two Structure Plan (2017)*

The Heritage Park Phase Two Structure Plan covers the land to the northern side of Serpentine Road, guiding and coordinating subdivision and development of that land (refer Figure 8: Heritage Park Phase Two Structure Plan).

The Heritage Park Phase Two Structure Plan was endorsed by the WAPC on 8 November 2017 and provides for development of the subject land for residential purposes, with a network of supporting public open space areas. Earthworks and construction has commenced.

The Baldivis East Structure Plan ensures integration with the planned road network, in particular extending the central north-south spine road through both sites. The location and configuration of public open space throughout the Baldivis East Structure Plan area has also been considered in the context of public open space within the Heritage Park Phase Two Structure Plan area, ensuring a uniform distribution of these spaces across both development areas.

*'Brightwood' (Lots 569 & 1263 Baldivis Road and Lot 21 Sixty Eight Road) Structure Plan (2015)*

The 'Brightwood' Structure Plan was adopted by the WAPC on 7 July 2015 and provides further detail to guide development and subdivision for land on the western side of Baldivis Road, commonly known as 'Brightwood' Estate. This includes establishing land uses and residential densities, creating a future high school site and setting out a comprehensive local road network (refer Figure 9: 'Brightwood' Structure Plan).

Importantly, the 'Brightwood' Structure Plan provides for a roundabout controlled intersection to Baldivis Road which will be used to connect the Structure Plan to the district road network, thereby consolidating the number of intersections to Baldivis Road.

*Baldivis South District Structure Plan*

The Amendment area abuts the south-eastern corner of the South Baldivis District Structure Plan (DSP) which is the district level planning framework for the locality, setting out a higher level context for land use, major roads, commercial centres, community infrastructure and public open space.

The DSP predates Perth and Peel@3.5million, the Sub-regional Planning Frameworks and subsequent amendments to the MRS and LPS2, all which have has since established the land as being suitable for urban development. Nonetheless the DSP provides context and in that respect the Structure Plan follows the overall intent of the DSP, setting the land aside for residential development and creating areas of public open space that coincide with the Parmelia Gas Pipeline that traverses the south-western corner of the site. The development of the Structure Plan area will see the South Baldivis growth corridor finished north of Sixty Eight Road.

*City of Rockingham Baldivis Tramway Master Plan (2014)*

The Baldivis Tramway Reserve abuts the western boundary of the Structure Plan area and is an area of remnant bushland with significant recreation, conservation and cultural qualities.

The purpose of the Baldivis Tramway Master Plan is to establish key directions including the use, development and management of the Tramway Reserve over the next ten years.

The Tramway Reserve is located outside of the Structure Plan area and future development will not directly impact upon the Tramway Reserve. Nonetheless, it is acknowledged that as part of subsequent landscaping and development, due regard to the Tramway Reserve Master Plan will be required, with consideration to the interface treatment between future development and the Reserve.


**Figure 8 Heritage Park Phase Two Structure Plan (2017)**
*Source: Creative Design & Planning / Nearmap*

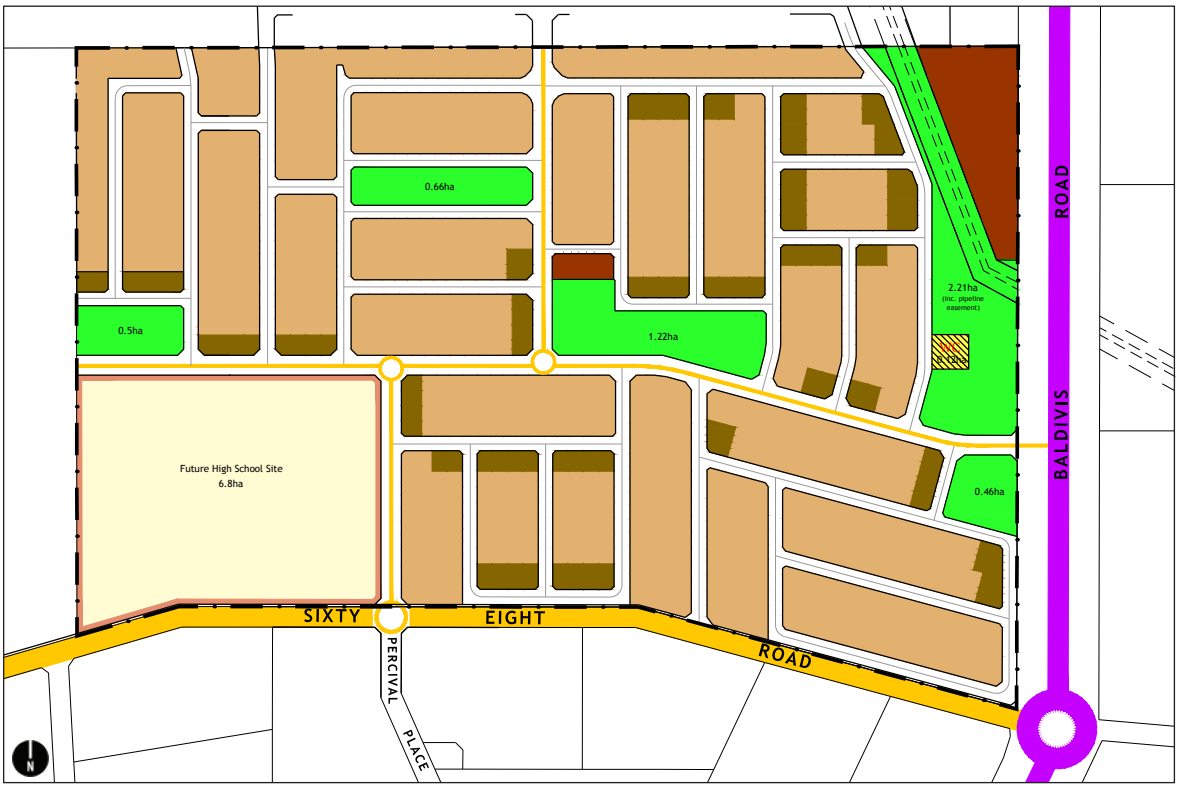



**Figure 9 Brightwood Structure Plan (2015)**

# 2.0 Site Conditions and Constraints

The Structure Plan area has been cleared and used for peri-rural pursuits, primarily horse grazing and agistment which has a resulted in most of the natural environment being removed, highly disturbed and/or degraded.

360 Environmental have prepared a comprehensive Environmental Assessment Report (EAR) which describes the site conditions and constraints within the Structure Plan area. The EAR demonstrates that the site is relatively unconstrained and that the environmental factors affecting the site, including groundwater, drainage and bushfire management can all be addressed adequately through the planning approval process and through the application of appropriate land use responses and management practices.

The following section summarises the key findings of this analysis with a complete copy of the EAR provided as Appendix 1.

## 2.1 Topography, Geology and Soils

The Structure Plan area is relatively flat, ranging from approximately 3m Australian Height Datum (AHD) to the east and up to 5.25m AHD to the west. An artificial drain (a section of the Peel Sub-drain) runs thorough the site from north to south, with inverts at approximately 2.25m AHD (or 0.7m below natural ground level).

A geotechnical investigation was undertaken by Galt in 2015 which found the western portion of the Structure Plan area to comprise of fine to coarse grained sand overlying clayey sand, whilst the eastern portion consisted of organic clay overlying high plasticity clay.

The topography and soils within the Structure Plan area can be made suitable for urban development.

### 2.1.1 Acid Sulphate Soils

The Department of Water and Environmental Regulation (DWER) Acid Sulphate Soil (ASS) risk mapping shows the entire Structure Plan area as low to moderate risk of ASS occurring within 3m of the surface.

The Structure Plan area is therefore suitable for urban development with an ASS management plan to be prepared in the usual manner prior to subdivision works.

### 2.1.2 Contamination

The Structure Plan area is not located within any DWER listed contaminated sites with past and present use of the land for peri-rural pursuits not generating a high risk of contamination.

Nonetheless a Preliminary Site Investigation (PSI) was undertaken by 360 Environmental to assess the presence of contamination in the soil beneath the site, given previous agricultural pursuits undertaken on the site. The results of the PSI confirm that the site is suitable for residential development. A copy of the PSI is provided as part of the Environmental Assessment Report provided as Appendix 1.

## 2.2 Flora and Vegetation

The majority of the Structure Plan area is cleared of native vegetation, a consequence of the long period of semi-agricultural activity on the land with only scattered remnant trees remaining. The site is parkland cleared with no understorey except grass and weeds.

A search of the Department of Biodiversity, Conservation and Attractions 'NatureMap' and the Department of Environment and Energy 'Protected Matters Search Tool' suggests the potential presence of some significant species occurring within 5km of the Structure Plan area; however, due to the heavily degraded nature of the site and lack of understorey, it is highly unlikely that the Structure Plan area could support significant flora.

Similarly, a search of the DWER Threatened and Priority Ecological Community database identifies no known priority ecological communities or threatened ecological communities within the site.

## 2.3 Fauna

A search of the Department of Biodiversity, Conservation and Attractions 'NatureMap' and the Department of Environment and Energy 'Protected Matters Search Tool' identified a number of fauna species as potentially occurring within 5km of the Structure Plan area, but given the site is largely cleared and is devoid of understorey, it does not contain suitable habitat for the conservation of significant fauna species.

A few scattered remnant trees can be found across the Structure Plan area; however, due to the lack of nature understorey and continuous canopy cover, the opportunity for Black Cockatoos to utilise the site is limited.

The Structure Plan area is highly disturbed and development of the site will not have significant impact on any fauna species of conservation significance.

## 2.4 Hydrology

The management of ground and surface water is comprehensively addressed within the Local Water Management Strategy (LWMS) prepared by Urbaqua Hydrologists in support of the Structure Plan.

The LWMS clearly demonstrates that hydrology is not a constraint to urban development. The existing hydrological conditions of the Structure Plan area are summarised below, while the key principles of the LWMS are discussed further in Section 3.7.

### 2.4.1 Ground Water

The Department of Water and Environmental Regulation Perth Groundwater Atlas maximum contours do not extend over the Structure Plan area. Minimum groundwater contours indicate a groundwater level of 2m AHD with little variation across the site.

A pre-development monitoring programme was undertaken by way of ten groundwater monitoring bores installed throughout the Structure Plan area, with level and quality results gathered between October 2015 and January 2017. The results of the monitoring indicated a maximum groundwater level across the Structure Plan area varying from 3.5m AHD to 4.1m AHD.

### 2.4.2 Surface Water

Surface runoff from the Structure Plan flows to the Peel Sub-Drain, an open drain presently maintained by the Water Corporation which flows north to south through the eastern portion of the Structure Plan area. The Peel Sub-Drain is a tributary of and connects to the Peel Main Drain which is located approximately 115m east on the opposite side of the Kwinana Freeway. Ultimately the Peel Main Drain then conveys surface water flows to the Serpentine River and the Peel-Harvey Estuary.

### 2.4.3 Wetlands

The Department of Biodiversity, Conservation and Attractions geomorphic wetlands database shows a Multiple Use management category wetland located in the Structure Plan area which is a low management category wetland with little or no ecological value, making it suitable for urban development.

## 2.5 Heritage

The Department of Aboriginal Affairs Aboriginal Heritage Enquiry Systems list no registered sites within or adjacent to the Structure Plan Area. There are no listed European sites of heritage significance located within the subject site.

## 2.6 Bushfire Management

EcoLogical Australia has prepared a Bushfire Management Plan (BMP) in accordance with WAPC's State Planning Policy 3.7: Planning in Bushfire Prone Areas and its Guidelines.

The BMP concludes that bushfire risk is not an impediment to development and that the bushfire risk can be managed through the implementation of asset protection zones, interface treatments and the construction of dwellings within 100m of bushfire prone vegetation in accordance with AS3959 Construction of buildings in bushfire prone areas.

A complete copy of the BMP is included as Appendix 2 with the manner in which the Structure Plan responds to bushfire hazards, discussed in further detail within Section 3.4 of this report.

## 2.7 Road Transport Noise

A Road Traffic Acoustic Assessment has been undertaken by Herring Storey Acoustics, assessing the impacts of traffic movements along Kwinana Freeway, which abuts the eastern boundary of the Structure Plan. This Assessment has been prepared in accordance with State Planning Policy 5.4 – Road and Rail Transport Noise and Freight Consideration in Land Use Planning (SPP 5.4).

The Assessment considers noise impacts with regard to an existing 2.4m high noise wall built by Main Roads WA, constructed as part of works associated with this section of the Freeway. The Assessment identifies a small number of dwellings that exceeds the 'noise target' and outlines the appropriate Quiet House Design criteria to satisfy SPP 5.4. Notification would also be placed onto titles of affected properties to inform future owners of potential impacts and required treatments.

A copy of the Road Traffic Acoustic Assessment is provided as Appendix 3.

# 3.0 Land Use and Subdivision Requirments

## 3.1 Land Use

The Structure Plan provides for a robust planning framework for the development and delivery of a future residential community within the broader Baldivis growth cell. A Development Concept Plan has been prepared for the site to demonstrate how the development could occur based on the Structure Plan principles and requirements (Figure 10: Development Concept Plan).

It is noted that the Development Concept Plan represents only one way development could occur. The Development Concept Plan will be refined at the time of subdivision.

The key principles of the Development Concept Plan are to:

- Allow for the creation of a diverse range of high quality housing choices that appeal to a wide market segment.
- Deliver high quality open space areas that serve both an amenity and local drainage function.
- Deliver a permeable, interconnected road and path network.
- Provide an urban form that responds to the local context and location within the Baldivis locality.
- Extend the necessary services and infrastructure in a timely and coordinated manner to support the future development.

Based on these principles, the Structure provides a planning framework for the following:

- A yield of approximately 440-460 dwellings across the Structure Plan area, with residential densities of R30 and R40. The R30 serves as a base code whilst the R40 density is focused around key access roads and areas of high local amenity.
- An area of approximately 3.7 hectares of public open space ensuring opportunities for passive recreation and, delivering key local drainage objectives whilst protecting the Parmelia Gas Pipeline.
- A permeable local road network that connects to the existing regional road network, providing for pedestrian and cycling infrastructure, and future public transport services.
- Appropriate separation between identified bushfire hazards along the western, eastern and southern edges of the Structure Plan area and all future dwellings.

A Land Use Schedule is included as Table 2, and should be read in conjunction with the Development Concept Plan (Figure 10), and the Public Open Space Schedule, shown as Table 3.

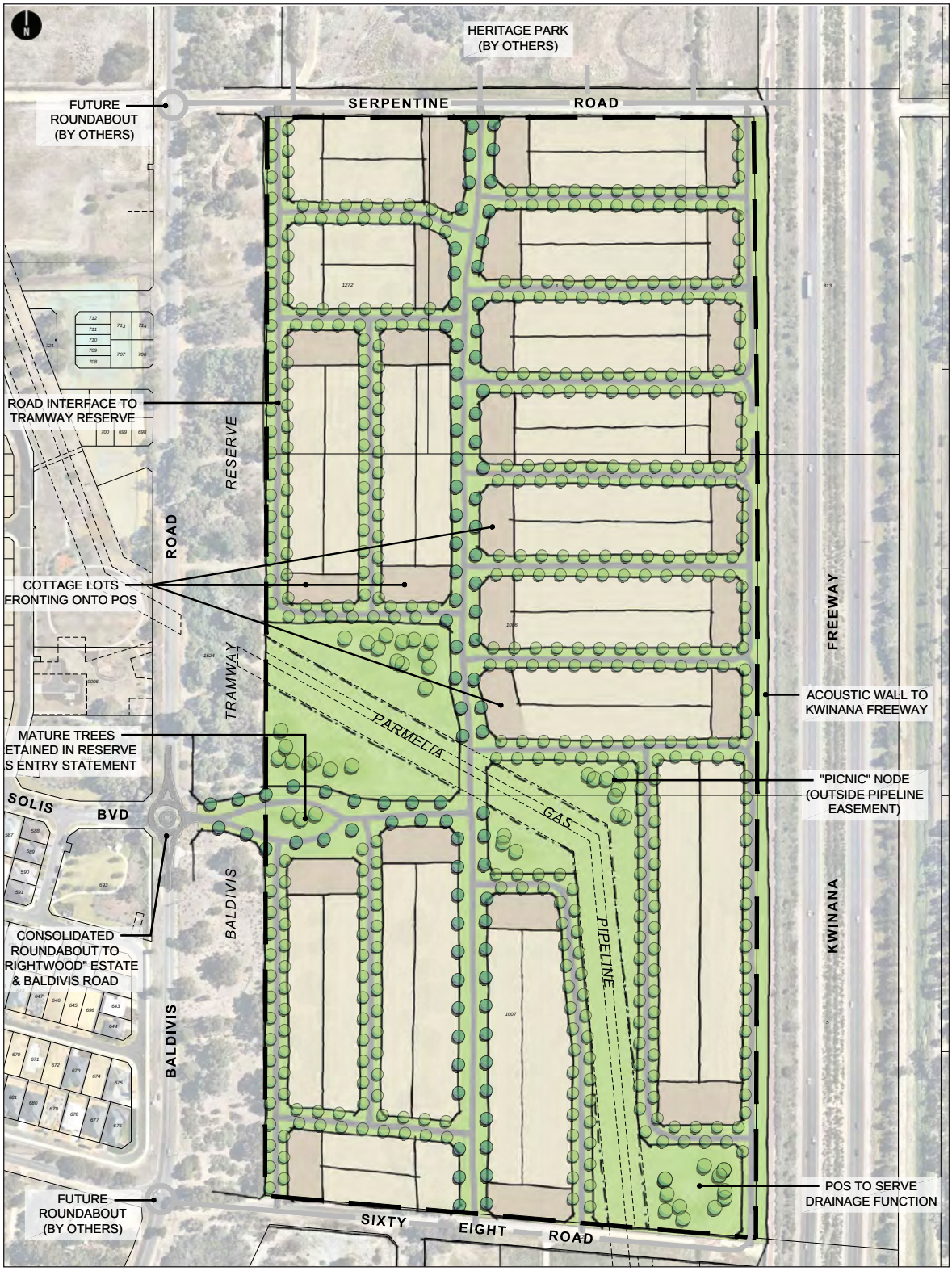



**Figure 10 Development Concept Plan**

Table 2: Land Use Schedule (all areas in hectares)

| | | | |
|---|---|---|---|
| **Gross Site Area[1]** | | | **26.98** |
| **Deductions[2]** | | | |
| Total drainage area up to the 1:1 year event | 0.13 | | |
| ***Total*** | | ***0.13*** | |
| ***Gross Subdivisible Area*** | | | ***26.85*** |
| ***Public Open Space @ 10%*** | | ***2.68*** | |
| **Public Open Space Contribution** | | | |
| Minimum 80% unrestricted POS | 2.14 | | |
| Maximum 20% restricted POS able to be credited | 0.54 | | |
| **Unrestricted Open Space** | | | |
| Public Open Space 1 | 1.20 | | |
| Public Open Space 2 | 1.01 | | |
| ***Total Unrestricted Use*** | | ***2.20*** | |
| **Restricted Open Space** | | | |
| Drainage area between 1:1 and 1:5 year events not exceeding 20% of total open space area[2] | 0.47 | | |
| Area of Parmelia Gas Pipeline easement[3] | 1.46 | | |
| ***Total Restricted Use Open Space*** | | ***1.93*** | |
| Restricted Use Open Space Surplus | 1.39 | | |
| ***Revised Gross Area*** | | | ***25.46*** |
| Revised Public Open Space @ 10% | | 2.55 | |
| **Summary of Public Open Space** | | | |
| Unrestricted Open Space Provided | 2.20 | | (80.4%) |
| Restricted Open Space Provided | 0.54 | | (19.7%) |
| **Total Unrestricted & Restricted Public Open Space Provision** | | | **2.74** |
| **Total Public Open Space Provisions as a % of Gross Subdivisible Area** | | | **10.2%** |

*Notes:*

1. *The site area is the total area of Lots 1006, 1007 and 1272 Baldivis Road, Lot 1 Serpentine Road and Lot 503 (of no street address), Baldivis.*
2. *In accordance with Liveable Neighbourhoods: the area subject to indunation more frequently than a one year average recurrance interval rainfall event is not included as restricted or unrestricted open space and is a deduction from the net site area (LN R33); areas for the detention of stormwater for a greater than one year average recurrance interval up to the five year recurrance interval is restricted open space up to 20%, the area greater than 20% is a deduction (not applicable in this case) (LN R26 & Table 11); areas for the dentention of stormwater for a greater than five year average recurrance interval is within unrestricted open space (LN R25).*
3. *The Parmelia Gas Pipeline easement has been taken as forming restricted open space, while open space falling within the associated pipeline buffer is considered as unrestricted, as set out in the City of Rockingham Local Planning Policy 3.4.1: POS.*

Table 3: Public Open Space Drainage Area Schedule (all areas in sqm)

| | | Deductions[3] | Restricted Use Open Space[4] | | Unrestricted Use Open Space[5] | |
|---|---|---|---|---|---|---|
| **Local Open Space Area** | **Gross Area[1]** | **1:1 yr Drainage Area[3]** | **Gross Area less 1:1 yr Drainage Area** | **1:5 yr Drainage Area[4]** | **Area not receiving drainage for < 5 yr event** | **1:5 - 1:100 yr Drainage Area[5]** |
| **POS 1 (West)** | 13,000 | 620 | 12,380 | 1,035 | 11,965 | 180 |
| **POS 2 (East)** | 15,000 | 645 | 14,355 | 4,940 | 10,060 | 1,100 |
| **Total** | **28,000** | **1,265** | **26,735** | **5,975** | **22,025** | **1,280** |

*Notes:*

1. *The gross area of individual open spaces exclude the gas pipeline easement area.*
2. *The 1:1, 1:5 and 1:100 year drainage volumes have been sourced from the Urbaqua LWMS (dated August 2019).*
3. *The 1 year average recurrence interval areas shown in the table are based on management of the first 15mm runoff in accordance with Department of Water and Environmental Regulation policy.*
4. *Areas subject to inundation more frequently that a one year average recurrence interval rainfall event are not included as restricted or unrestricted open space and are a deduction from the net site area.*
5. *Areas for the detention of stormwater for a greater than one year average recurrence interval up to the five year recurrence interval are treated as restricted open space up to 20%.*
6. *Areas for the detention of stormwater for a greater than five year average recurrence interval are within unrestricted open space and receive a full open space credit.*

## 3.2 Residential

The Structure Plan provides a framework to support delivery of a diverse range of housing. The density and style of housing across the Structure Plan area is responsive to the characteristics of different parts of the site and will be delivered with the objective of creating affordable built form and high quality streetscapes.

### 3.2.1 Dwellings Yields and Density Targets

The Structure Plan has the potential to create approximately 440-460 residential lots, set in a density range of R30 and R40 and based on the following planning principles:

A base coding of R30 applies, providing opportunities to deliver a range of front loaded lots ranging in size from 300m² to 450m².

Medium density R40 coded lots are typically fronting areas of public open space (where a higher level of amenity exists), and on street corners or at the end of street blocks where good opportunities for integration exists. This coding provides the opportunity to deliver cottage style housing (single or double storey) with front or rear laneway access or for the contemporary 'compact' lots, that typically book-end street blocks in order to create a traditional streetscape to the secondary street, acknowledging that the DCP at this time does not envisage "laneway" cottage lots. Single lot sizes will generally range from 180m² to 300m².

Perth and Peel@3.5million recommends a housing density target of 26 dwellings per residential site hectare with the aim of this target to encourage more efficient use of infrastructure and housing. The Structure Plan has the potential to achieve 29.6 dwellings per site hectare, exceeding the target set out in Perth and Peel@3.5million. This figure exceeds the Liveable Neighbourhoods requirement of 22 dwellings per residential site hectare.

### 3.2.2 Local Development Plans

Local Development Plans (LDPs) will be required where specific variations to the Residential Design Codes are needed to deliver a contemporary built form response. These LDPs will be required as a condition of subdivision approval, and be approved by the City of Rockingham.

The City of Rockingham's Local Planning Policy 3.3.22 'Medium Density Housing Single House Development Standards – Development Zones '(R-MD Codes) sets out acceptable variations to the deemed-to-comply provisions of the R-Codes for the lots coded R30 to R60. The variations set out in the R-MD Codes Policy will apply to the Structure Plan area and thereby constitute Acceptable Development. This will avoid the need for LDP's over the majority of lots, improving efficiencies and minimising costs to the end user and to the local government.

LDP's will only be confined to following site specific considerations that may require detailed design responses:

- Lots abutting areas of public open space; and
- Lots affected by road traffic noise.

The following outlines the key provisions that will be addressed in these LDPs.

*Lots abutting areas of Public Open Space*

Typically the interface to public open space at the time of subdivision will be via roads, however, in some instances direct lot frontage is an appropriate design response providing product diversity, amenity and increased surveillance of the public spaces.

Liveable Neighbourhoods supports residential lots directly abutting open space where the functionality of the POS is not compromised, and where the dwelling adjoining the the open space provides adequate visual surveillance.

To ensure these public open spaces are not compromised, subsequent subdivision design and engineering detail will ensure that visitor parking is provided along adjacent streets, and the adjacent residential lots are elevated a minimum of 500mm above the POS ground level to create a visible separation between the private and public realm.

Where lots interface with open space LDPs will be prepared to control built form. These LDPs will address:

- appropriate setbacks to the public open space.
- major openings (other than bedrooms) to address the open space.
- permeable fencing  to promote surveillance.

*Lots affected by Rail Noise*

LDP's will be prepared for lots deemed to be affected by road traffic noise from the Kwinana Freeway, as identified in the Herring Storer Road Traffic Noise Assessment (Appendix 3).  The Structure Plan will mandate relevant 'Packages' and applicable construction standards that will apply.

The Road Traffic Noise Assessment is discussed in further detailed in Section 3.6.

## 3.3 Public Open Space

The Structure Plan creates a framework for the delivery of pubic open space that will serve a range of functions within the Structure Plan area, balancing active and passive recreational pursuits and delivering key drainage objectives.

The Structure Plan provides for approximately 2.74ha of local open space which (when Liveable Neighbourhoods credits are applied) represents around 10.2% POS as shown in Table 2 (Land Use Schedule), Table 3 (Public Open Space and Drainage Schedule) and Figure 11: Landscape Masterplan.

The following is a summary of the key aspects of the open space provision based on Liveable Neighbourhoods requirements. A more detailed description of the public open space is provided in Section 3.3.1.

- 4.3ha (gross) of open space is distributed across the Structure Plan, accommodating both active and passive uses and in part accommodating and protecting the Parmelia Gas Pipeline easement.
- Approximately 1,200m² of the open space will receive drainage from the first 15mm storm events (for calculation purposes this is treated as the 1 year storm event and taken as a deduction from the Net Site Area, as set out in Liveable Neighbourhoods). This stormwater will be infiltrated close to source, using bio-retention areas within areas of open space.
- Only 0.54ha (approx.) of the public open space is made up of restricted use open space, as credited by Liveable Neighbourhoods. Liveable Neighbourhoods specifies that no more than 2% of the 10% public open space can be made up of restricted use open space.
- The Parmelia Gas Pipeline easement (which measures approximately 1.46ha) has been treated as a restricted use open space.

Liveable Neighbourhoods recommends that no more than 20% of public open space should be made up of 'restricted use' open space, with the aim being to ensure open space areas provide a balance between offering a diversity of recreational options while also incorporating water sensitive design principles and nature spaces that protect areas of environmental significance.

While the Structure Plan is provided with 10.2% creditable public open space, surplus restricted use open space has been taken as a deduction from the from the Gross Subdivisible Area (in accordance with Liveable Neighbourhoods) .

The Landscape Masterplan prepared by LD Total in support of the public open space strategy is included as Appendix 4.

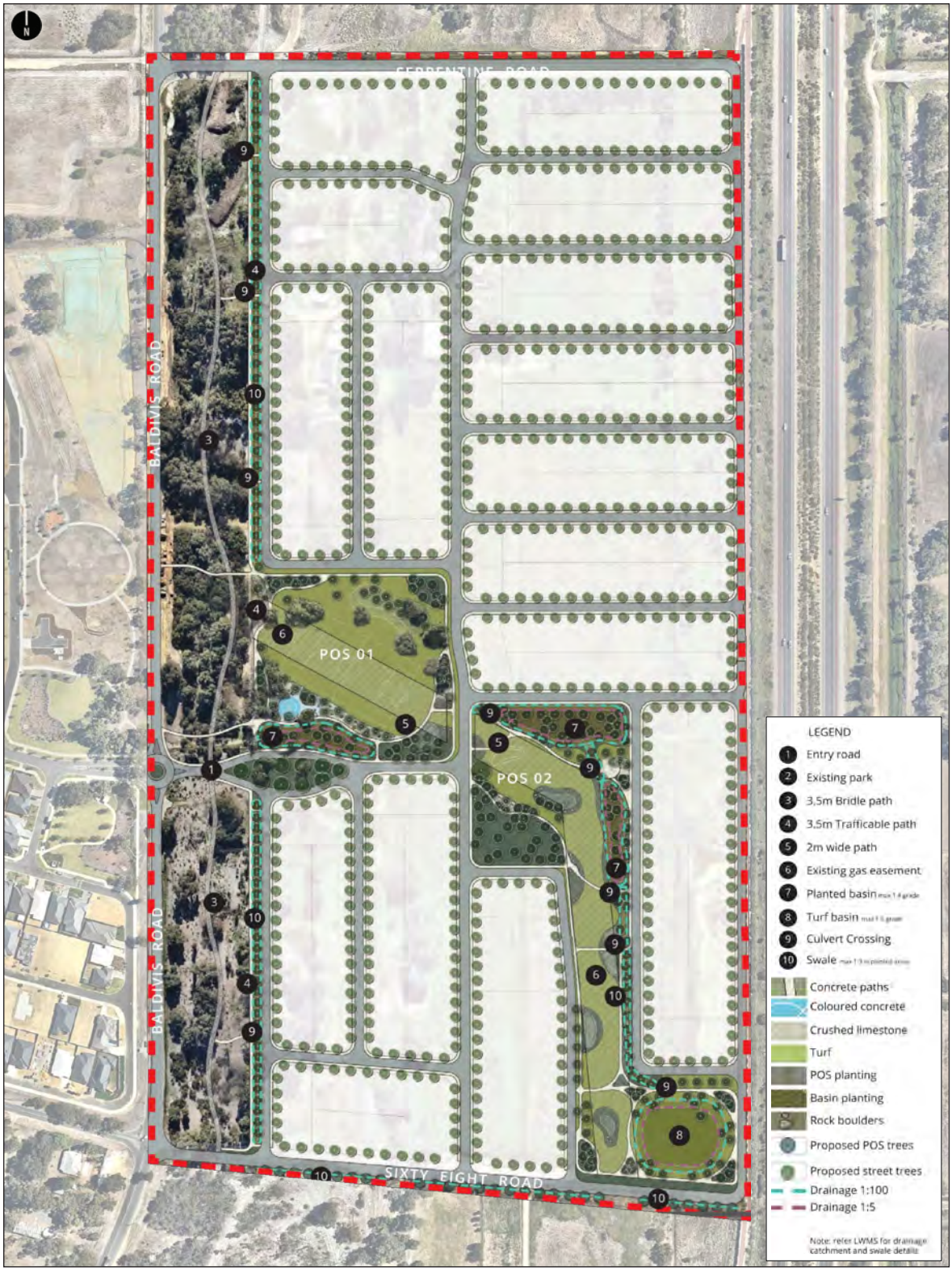



**Figure 11 Landscape Masterplan**
*Source: LD Total*

### 3.3.1 Description of Public Open Space

The Landscape Masterplan prepared by LD Total describes the intended function and design principles of each area of public open space (refer Figure 11: Landscape Masterplan). The Structure Plan ensures that public open space can serve a variety of functions throughout the Structure Plan area, balancing active and passive recreational pursuits, whilst accommodating and protecting the Parmelia Gas Pipeline.

It is important to note the landscaping designs shown are conceptual only and will be refined as part of subsequent phases of planning in consultation with the City of Rockingham.

The following is a summary of the key characteristics of the open space:

*Public Open Space 1*

- Located immediately north of the Baldivis Road entry point and east of the Baldivis tramway reserve, measuring approximately 1.7ha.
- Retention of remnant mature trees within road reserve south of the public open space area providing opportunities for an immediate entry statement.
- Open turfed area straddling the Parmelia Gas Pipeline easement will provide for play and soccer 'kick-out' spaces with no structural elements within the easement. Development of this space will be undertaken in consultation with the pipeline owner and operator.
- Opportunities to provide ball hardstand areas and exercise zones outside the gas pipeline easement.
- Remainder of the site comprising native or low water use shrubs and grasses, for easy and low cost maintenance.
- Creates an opportunity for pedestrian pathways and seating, connecting the public open space with Baldivis Tramway reserve and the remainder of the Structure Plan area.
- Provides for integrated drainage basin, vegetated with native species to add to the overall character and diversity of the development.

*Public Open Space 2*

- Located in the eastern portion of the Structure Plan area, measuring approximately 2.5ha.
- Primarily grassed area, recognising and protecting the gas pipeline easement.
- Opportunities to provide picnic and seating area outside the gas pipeline easement.
- Remainder of the site comprising native or low water use shrubs and grasses, for easy and low cost maintenance.
- Creates an opportunity for pedestrian pathways and seating, forming part of the wider pathway network throughout the Structure Plan area.
- Provides for integrated drainage basins, both grassed and planted with native species to provide for necessary drainage function.

*Baldivis Tramway Reserve*

- Abuts the full extent of the western edge of the Structure Plan area.
- Opportunities to provide 3.5m bridal path meandering north-south along the Tramway reserve, as set out in the Baldivis Tramway Master Plan.
- Minimal disruption to Tramway reserve, recognising the objective in conserving the natural and cultural environments.
- Pedestrian footpath located along the eastern edge of the Tramway, within abutting road reserve.

The provision of public open space throughout the Structure Plan area has been provided in recognition of two areas of public open space being north of Serpentine Road within the Heritage Park Phase Two development, but which are in close proximity to the Structure Plan area. Collectively this will ensure all future residents are located within 400m and an area of public open space (Figure 12: POS Context).


**Figure 12 POS Context**
*Source: LD Total*

## 3.4 Bushfire Management

The Structure Plan provides a design response and planning framework that addresses potential bushfire hazards. It demonstrates that the risk from bushfire is not an impediment to development and it can be managed through a combination of building protection zones, mandatory dwelling setbacks and appropriate construction standards.

In accordance with the WAPC 'State Planning Policy 3.7: Planning in Bushfire Prone Areas' and 'Planning for Bush Fire Protection Guidelines', a Bushfire Management Plan has been prepared by EcoLogical Australia. It includes a detailed (post-development) Bushfire Hazard Level Assessment.

This Hazard Assessment shows that bushfire prone vegetation (post-development) is restricted to:

- Woodland within the Baldivis Tramway reserve which abuts the western edge of the Structure Plan area;
- Grassland located to the south-western corner of the Structure Plan area; and,
- Scrub located within the Kwinana Freeway reserve abutting the eastern edge of the Structure Plan.

The Assessment requires that an Asset Protect Zone (APZ) be established between the identified bushfire prone vegetation and any future dwellings in order to achieve a Bushfire Attack Level (BAL) of 29 or less in accordance with AS3959 "Construction of buildings within bushfire prone areas." The Structure Plan creates this APZ through the locating streets and mandatory building setbacks between the identified bushfire risk and any future dwellings, ensuring BAL-40 and BAL-FZ construction standards are not required.

## 3.5 Movement Network

A comprehensive Transport Impact Assessment has been prepared by KCTT traffic engineers (refer Appendix 5) which forecasts traffic volumes and sets out a recommended road network hierarchy to accommodate expected traffic flows. The following section discusses the key elements of the Assessment, including the existing and planned movement network, road hierarchy classification and an overview of the cyclist and pedestrian network.

### 3.5.1 Existing Movement Network

The Structure Plan is supported by a regional road network that allows for good connections to local, district and regional destinations. Key aspects of the existing road network surrounding the Structure Plan area are:

- **Kwinana Freeway** abuts the eastern boundary of the Structure Plan, is reserved as a Primary Regional Road under the MRS and is classified in the network as a Primary Distributor, under the control of Main Roads WA. This road is accessed via interchanges at Safety Bay Road (north) and Karnup Road (south) and it is the regional road connection for the locality.
- **Baldivis Road** runs to the west of the Structure Plan area (abutting the Baldivis Tramway reserve) and is classified as a Regional Distributor (abutting the Structure Plan area). It is presently constructed as a two lane undivided carriageway.
- **Serpentine Road** is presently a local Access Road that abuts the northern edge of the Structure Plan area and is constructed as a single carriageway, two-lane road.
- **Sixty Eight Road** is a local Access Road that abuts the southern edge of the Structure Plan area, constructed as a single carriageway, two-lane road.
- **Solis Boulevard** is the major east-west road passing through 'Brightwood' estate located on the eastern side of Baldivis Road. A four-arm roundabout is to be constructed as part of the 'Brightwood' estate, comprising two through lanes in each direction at the Baldivis Road / Solis Boulevard intersection.

### 3.5.2 Proposed Movement Network

*Road Network*

A Transport Impact Assessment has been prepared by KCTT which comprehensively addresses traffic movement considerations within the Structure Plan area. A complete copy of the KCTT Transport Impact Assessment can be found as Appendix 5.

The planned road network shown on the Development Concept Plan provides a robust and permeable layout throughout the Structure Plan area, with strong, direct linkages in both an east-west direction, and in a north-south direction.

The Road Hierarchy Plan shows the hierarchy of the movement network planned for the area and the external connections to the existing network (Figure 13: Road Hierarchy).

The key aspects of the planned road network are as follows:

- **Baldivis Road** is a dedicated road reserve, classified as a Regional Distributor Road adjacent to the Structure Plan and as a Distributor B Road north of Serpentine Road. Upgrade works to Baldivis Road are a requirement of the 'Brightwood' Estate.
- **Sixty Eight Road** (abutting the southern edge of the Structure Plan area) is to remain classified as an Access Road, upgraded to an urban standard.
- **Serpentine Road** (abutting the northern edge of Structure Plan area) has been reclassified as a Neighbourhood Connector as part of the Heritage Park Phase 2 Structure Plan.
- **Access Streets** - proposed to contain a pavement width of ranging between 6m and 7.2m with a reserve width ranging from 14.2 to 15.4m, to be reduced by 1m when adjacent to public open space.
- **Laneways** - while the current Concept Plan does not suggest the provision of laneways, should they be proposed these shall be a minimum width of 6m to accommodate two way movements and rubbish collection, increased to a width of 9m where these provide the only public road frontage.

All road reserve widths are subject to detail design and approval by the local government at the time of subdivision.

In addition to the 'Brightwood' roundabout, an additional roundabout is planned for the Baldivis Road / Sixty Eight Road intersection, with the delivery of this roundabout the responsibility of the proponent, as part of the 'Brightwood' estate.

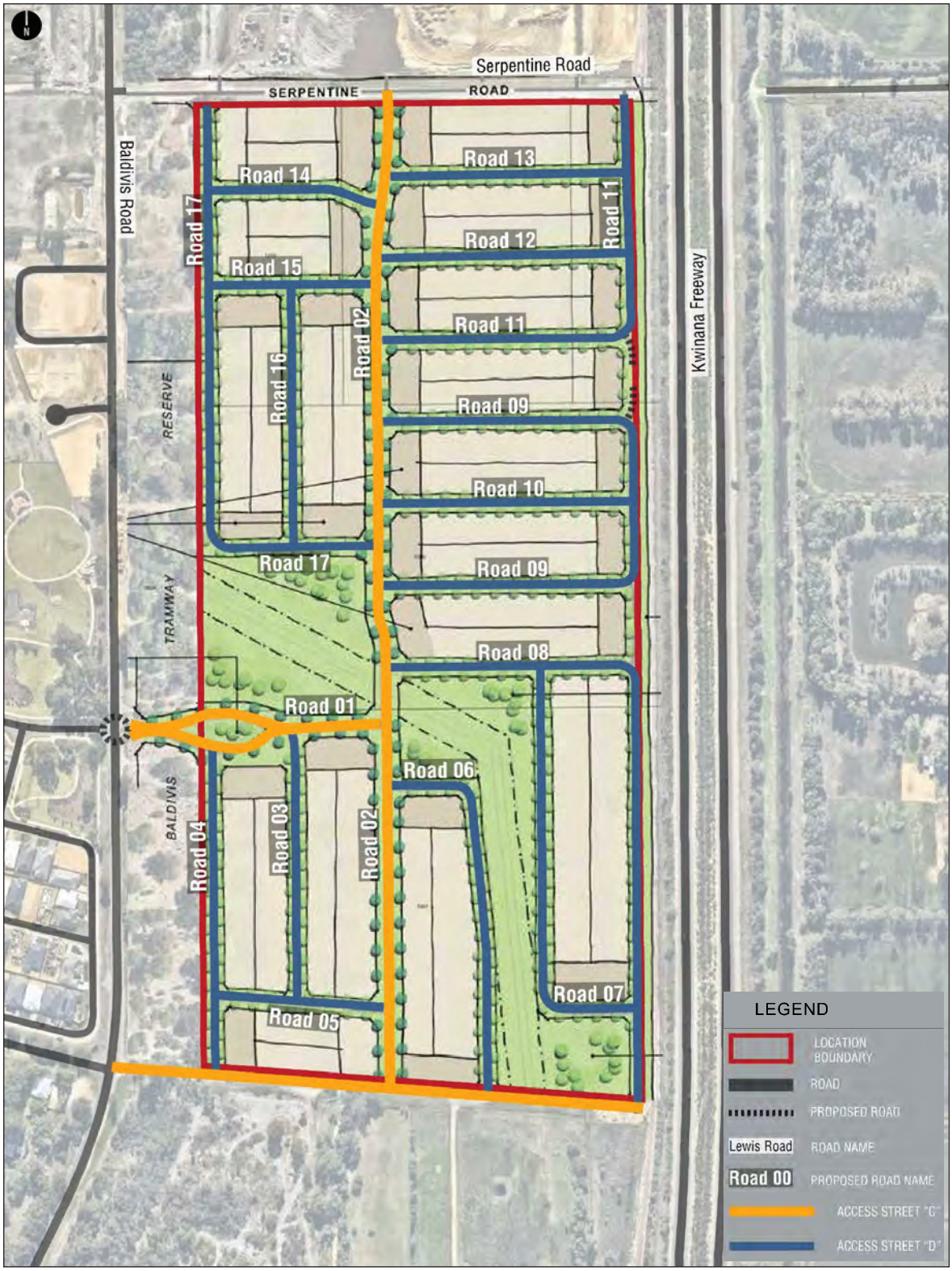



**Figure 13 Road Hierarchy**
*Source: KCTT*

*Pedestrian & Cyclist Facilities*

The Structure Plan delivers a safe and legible pedestrian and cycle movement network within the Structure Plan area (Figure 14: Pedestrian and Cyclist Facilities). The key principles for determining the planned pedestrian and cycling facilities are as follows:

Footpaths or shared paths on at least one side of all access roads.

Shared path along the southern side of Serpentine Road, connecting to the Principal Shared Pathway along the Kwinana Freeway and connecting to Baldivis Road.

These key principles and the final location of footpaths and shared paths will be determined in consultation with the City of Rockingham as part of the detailed engineering stage following subdivision approval.

*Public Transport*

The Structure Plan provides a critical mass that will in turn support the development of a robust public transport service. Presently bus services 566 and 567 run through existing development west and east of Baldivis Road respectively, both services terminating at the Baldivis Road / Furioso Green intersection, located approximately 500m of the Structure Plan area. It is anticipated that these bus routes will service the Structure Plan area along Baldivis Road and will be capable of accommodating a public bus route.


**Figure 14 Pedestrian and Cyclist Facilities**
*Source: KCTT*

### 3.5.3 Analysis of the Transport Network

KCTT have undertaken comprehensive traffic modelling for the movement network proposed by the Structure Plan. It demonstrates that the proposed network and associated reserve widths have the capacity to accommodate expected traffic volumes resulting from future development.

All vehicle movements fall within the acceptable limits outlined by Liveable Neighbourhoods for the road categories proposed by the Structure Plan, and all intersections have been shown to operate satisfactorily.

It is important to note that the traffic modelling undertaken incorporates all planned and existing development surrounding the Structure Plan area, including the land located on the western side of Baldivis Road (most pertinently including the 'Brightwood' estate at ultimate development) and traffic volumes generated by the emerging Heritage Park Phase Two Structure Plan to the north of the Structure Plan area. This has ensured a transparent and robust model.

The precise nature and function of all internal intersections will be determined once the location and alignment of access streets will be finalised as part of the subdivision approval. All intersection spacing and treatments will be designed to accord with Liveable Neighbourhoods standards.

## 3.6 Traffic Noise Assessment

A Road Traffic Noise Assessment has been prepared by Herring Storer Acoustics in support of the Structure Plan, prepared in accordance with State Planning Policy 5.4 – Road and Rail Transport Noise and Freight Consideration in Land Use Planning ('SPP 5.4').

The assessment modelled and assessed potential road traffic noise impacts upon the Structure Plan area, a result of vehicles travelling along Kwinana Freeway.

The assessment concludes that noise received at future residences located adjacent to Kwinana Road would exceed acceptable noise limit targets outlined in SPP 5.4 but that traffic noise is alleviated through the an existing 2.4m high noise wall constructed as part of the design work for this section of the Freeway with facade protection treatment (Quiet House Design packages) required for affected properties. Notifications on title to inform landowners of the necessary construction standards shall also be applied.

The Herring Storer 'Road Traffic Noise Assessment' is provided as Appendix 3.

## 3.7 Water Management

The Structure Plan has been designed to accommodate best practice urban water management principles by integrating stormwater detention and infiltration within areas of public open space, swales and roadside rain gardens.

A Local Water Management Strategy (LWMS) has been prepared by Urbaqua in support of the Structure Plan prepared in accordance with the principles and objectives of WAPC's Better Urban Water Management Guidelines and is consistent with the approved District Water Management Strategy. A copy of the LWMS is provided as Appendix 6.

Establishing key principles for the management of stormwater runoff and groundwater quality, implementation of the LWMS will be through the development of subsequent Urban Water Management Plans (UWMP), which will be prepared at the time of subdivision.

### 3.7.1 Stormwater Management Strategy

Stormwater management will be undertaken based around DWER water sensitive design practices and refines the stormwater strategy set out in the approved District Water Management Strategy that is applicable for the site, summarised as follows:

- Stormwater from the first 15mm will be infiltrated close to source, using lot soakwells, road side swales and rain gardens and bio-retention areas within areas of open space providing for water quality treatment.
- Stormwater over and above the first 15mm event will then be directed to areas of public open space via a combination of swales, piped drain systems and (in the case of major storm events) road reserve, for retention and infiltration with these public open space areas.
- All residential premises will be required to have the finished floor levels elevated 300mm above the 100 year (1% AEP) floor level.
- Similar to development to the north, the Peel Sub-drain will be piped through the Structure Plan area, discharging southwards via an outlet at the southern edge of the Structure Plan.

### 3.7.2 Groundwater Management Strategy

A preliminary earthworks strategy has been prepared over the Structure Plan area in order to achieve suitable separation to groundwater.

Minimum separation between building floor levels of future development and groundwater will be achieved by a combination of fill and subsoil drainage to protect against any post-development groundwater rise. Finished levels and fill requirements, as a detailed design issue, will be addressed as part of the engineering design and UWMP stage.

All subsoil drainage will be free draining in accordance with Department of Water and Environmental Regulation requirements and treated for water quality prior to discharge while subsoil drainage will be determined at UWMP stage.

### 3.7.3 Implementation and Monitoring

The LWMS sets the overall water management strategy for development within the Structure Plan area. It will be the responsibility of the developer to construct and maintain the stormwater drainage system in accordance with UWMP(s) to be prepared at subdivision stage.

Post-development monitoring of groundwater levels and quality will be carried out quarterly, over a three year period. All water quality testing will be undertaken by a NATA accredited laboratory in accordance with Australian Standards.

## 3.8 Activity Centres

The Structure Plan is in close proximity to a number of existing activity centres, ensuring immediate and excellent access to employment opportunities, and retail commercial and community services.

The Rockingham Strategic Metropolitan Centre is located 12.5km north-west of the Structure Plan, with the Mandurah City Centre located 20km south-west, both identified as a district centre in 'State Planning Policy 4.2 – Activity Centres for Perth and Peel', providing for a wider range of commercial, community and employment opportunities.

Likewise the Baldivis District Centre on Safety Bay Road is also located only 2.5km (north) from the Structure Plan area with a small local centre situated on Osgood Way in Settlers Hills (Baldivis), providing another choice in local amenity. Furthermore, additional centres are planned for the locality, as set out in the Baldivis South District Structure Plan further adding to services and amenity for future residents.

The Structure Plan responds to these planned centres in providing a future residential population and ensuring vehicle and pedestrian access to these centres which improves the retail catchment and commercial viability for these centres. The provision of a commercial centre within the structure plan area would be commercially unviable on the basis of the limited catchment being offered by the development and the number of established centres located elsewhere within the wider locality.

## 3.9 Education

The Structure Plan is well serviced by existing and planned educational facilities. There are no educational facilities planned or required within the Structure Plan area.

The 'Brightwood' Structure Plan delivered a government high school site approximately 800m east of the Structure Plan area, with this school presently under construction with a forecast opening in 2019.

The Structure Plan is also located in proximity to a number of government primary schools, including:

- Tuart Rise Primary School (approx. 1.2km west);
- Makybe Rise Primary School (approx. 1.4km north-west); and
- Rivergums Primary School (approx. 1.9km north).

Tranby College is a Kindergarten to Year 12 non-government school located on Eighty Road Road, approximately 3km north-west of the Structure Plan area, providing future residents with an alternative to government schools.

In accordance with Liveable Neighbourhoods and based on the estimated yield of 440-460 lots, the Structure Plan does not constitute a complete school catchment.

## 3.10 Servicing and Staging

The following section summarises the engineering considerations in the Engineering Servicing Report prepared by Pritchard Francis Engineers. The Engineering Servicing Report is provided in its entirety as Appendix 7.

### 3.10.1 Earthworks Strategy

A conceptual earthworks strategy has been prepared for the Structure Plan area, in consultation with the City of Rockingham, Water Corporation and the Parmelia Gas Pipeline operators. Key aspects of the earthworks strategy are:

- Match into ground levels proposed for the development north of Serpentine Road, including any changes to Serpentine Road as a result of development.
- Match into ground levels at Baldivis Road and the tramway reserve, including future upgrades to Baldivis Road and improvement works in the Tramway reserve.
- Match into and adjust ground levels through the Parmelia Gas Pipeline corridor to achieve an integrated and functional open space network.
- Interface with and reconstruct Sixty Eight Road, ensuring lots to the south are not adversely affected.
- Create finished levels within the Structure Plan area that accommodate gravity-reliant infrastructure to facilitate appropriate servicing (to the 'Brightwood' waste water pump station within the east of the Structure Plan area).
- Ensure a minimum separation distance from the maximum groundwater level and finished lot levels. This will entail appropriate clay works and clay grading to improve site conditions, appropriate for urban development.

### 3.10.2 Sewer Reticulation

Waste water from development within the Structure Plan area will be gravity fed to the existing 'Brightwood' waste water pump station (Type 90) which is located immediately east of Baldivis Road, which will then discharge to the East Rockingham Waste Water Treatment Plant.

### 3.10.3 Water Reticulation

The Structure Plan will be provided with reticulated water via 150mm mains which will be extended from development to the north and west of the site.

### 3.10.4 Electrical Reticulation

Existing Western Power overhead infrastructure is located about the Structure Plan area which has the capacity to service development. This infrastructure comprises a high voltage overhead power line running north-south through the western portion of the site which will be realigned and a low voltage overhead power line located along the eastern edge of the Baldivis tramway reserve. An underground high voltage power cable is also situated at the south-western corner of the Structure Plan area, which continues westwards down Sixty Eight Road.

### 3.10.5 Gas Supply

The Structure Plan area will be serviced via a high pressure main which is within the Baldivis Road reserve. Atco Gas has confirmed that these gas mains have capacity to service the Structure Plan area.

#### 3.10.6 Telecommunications

There is a current NBN Master Developer Agreement for the development of 'Brightwood' estate, a development being undertaken by Parcel Property. The NBN network will be extended into the Structure Plan area.

#### 3.10.7 Staging and Timing

It is anticipated that the Structure Plan will be staged responsive to market demand. Initially development will be focused around the Baldivis Road entry to facilitate the construction of the estate entry and extension of necessary services. Development is then likely to progress eastwards, providing for a progressive and logical extension to the estate.

This should be taken as indicative only and may be subject to change depending on market demand and other variables.

## 3.11 Parmelia Gas Pipeline

As discussed in Section 1.3.4, the Parmelia Gas Pipeline runs through the Structure Plan area protected within a service easement.

The WAPC's Planning Bulletin 87: High Pressure Gas Transmission Pipelines in the Perth Metropolitan Region allows residential development to abut the service easement along this section of the pipeline and ongoing liaison with APA (the pipeline operator) has confirmed that road reserves, public utilities and other infrastructure may be located within the pipeline easement. In order to facilitate this planned development, a Pipeline Risk Assessment (Safety Management Plan) has been prepared for the site, in accordance with Australian Standard AS2885 Pipelines – Gas and Liquid Petroleum. This Assessment identifies the threats to and from the Parmelia Gas Pipeline from the proposed development, and sets out actions that are to undertaken to ensure the on-going safe operation of the Pipeline.

Parcel Property (the proponent) acknowledges that any works proposed within the pipeline easement (such as road crossings) will be subject to approval under the Dampier to Bunbury Pipeline Act 1997 and must be undertaken in accordance with the Pipeline Risk Assessment (Safety Management Plan).

## 3.12 Developer Contributions

The Local Structure Plan falls within Development Contribution Area No. 2 and is therefore subject to community infrastructure costs in accordance with the relevant Development Contribution Plan and Cost Apportionment Schedule prepared pursuant to the City of Rockingham Local Planning Scheme 2.