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# **WEST MARTIN PRECINCT 1 OUTLINE DEVELOPMENT PLAN JUSTIFICATION REPORT**

Prepared for:-

**Fairwater Pty Ltd &  
LWP Properties Pty Ltd**

**June, 2006**

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**PART 1**  
**OPERATIVE PART**

This part of the document should be read in conjunction with the Outline Development Plan (ODP) map and pursuant to the provisions of the City of Gosnells Town Planning Scheme No.6 (the Scheme) shall form part of the ODP and any future amendments.

### **Formal Title of Outline Development Plan**

This Outline Development Plan shall have the formal title of the West Martin Outline Development Plan - Precinct One.

### **The Objectives of the Outline Development Plan**

- to provide a clear understanding of the principles which are to be applied in the development of the ODP area,
- to provide a design framework for the progressive and sustainable subdivision and development of the ODP area,
- to provide for the optimum locations and appropriate uses of public open space within the ODP area,
- to ensure the creation of an appropriate and safe integrated road system which optimises the legibility of the vehicular, pedestrian and cycle movement systems,
- to ensure maximum public accessibility, both visually and physically to the Canning River foreshore and regional open space areas generally,
- to provide for a walkable residential neighbourhood which is sensitive to the physical attributes and exceptional landscape quality of the locality,
- to ensure optimal design solutions and best-practice urban water management and drainage of the ODP area and surrounding land.

### **Contents of the Outline Development Plan**

The Outline Development Plan shall consist of the following:-

- An ODP Plan, and
- An ODP Text.

An ODP report and accompanying studies form part of the supporting documentation and will inform the planning for the West Martin Precinct One Outline Development Area but shall not form part of the Outline Development Plan nor any future amendments.

### **Outline Development Plan Area**

The area to which this Outline Development Plan applies is illustrated in Plan 1.

### **Commencement of Operation**

This Outline Development Plan commences operation on the date it is adopted by the Council pursuant to Clause 7.4.15 of the Scheme.

## ODP Period of Operation

At the time of formal adoption pursuant to Clause 7.4.15 of the Scheme, the intended period of operation of the ODP is five (5) years. To ensure that the ODP remains relevant a review is to be conducted not less than every five (5) years. The Council will consider the extent of the review and determine the appropriate action as defined by Clause 7.5 of the Scheme for minor amendment or Clause 7.4 of the Scheme for major amendment.

Conclusion of the Outline Development Plan is identified by the gazettal of the amendment to the Scheme that rezones the “residential Development” zone to the appropriate zonings as identified within the Scheme and as reflected on the ODP.

## Permissibility of Land Uses

In accordance with Clause 7.7.2 of the Scheme, where the Outline Development Plan imposes a classification on the land included in it by reference to reserves, zones, or Residential Design Codes (2002), until it is replaced by a subsequent amendment to the Scheme or a new Scheme imposing such classification:-

- (a) the provisions of the Outline Development Plan apply to the land within the Outline Development Plan Area as if the provisions were incorporated into the Scheme and it is binding and enforceable in the same way as corresponding provisions incorporated into the Scheme; and
- (b) provisions in the Scheme applicable to land in those classifications under the Scheme are to apply to the Outline Development Plan area.

Plan 1: Outline Development Plan Area

**PART 2**

**JUSTIFICATION REPORT**

## EXECUTIVE SUMMARY

This justification report has been prepared to support the proposed West Martin Precinct 1 - Outline Development Plan, which sets out the development objectives and rationale for one of the precincts identified in the West Martin Outline Development Plan (ODP) which was previously prepared by the City of Gosnells in 2003.

Precinct 1 & the adjoining Precinct 2 have a significant planning history which is considerably further advanced than the other proposed West Martin precincts, in that the areas have been zoned Urban for many years and have also been the subject of a previous subdivisional approval for the creation of 160 single residential lots and optional group housing sites. That subdivisional approval also included a further 34 single residential lots and a Motel, Reception Centre and Restaurant site, all of which were to be located on the abutting island site situated between what is now Ferres Drive and the Tonkin Highway.

A subsequent ODP Proposal and associated subdivisional application for Precincts 1 & 2 was also lodged in 2003 and presently remains undetermined, although it is anticipated that this will now be withdrawn and will be superseded by this proposal.

Prior to the original subdivision being approved the land situated to the south of Station Street had been subject to a number of environmental and drainage studies which had been conducted by the State Government in association with the City of Gosnells. These studies had resulted in clearly defined boundaries being established for the setting aside of a substantial area of Regional Parks and Recreation Reserve from the landholdings and the consequent establishment of finite urban boundaries on the land which now forms the area covered by this ODP and the adjoining land.

Action is currently underway by the City of Gosnells to rationalise the zonings of Precincts 1 & 2 to accord with the latest proposals now being promulgated by separate parties and a separate ODP for Precinct 2 which has been prepared by The Planning Group is already under consideration by the Council.

The West Martin Precinct 1 ODP establishes the intended urban design concepts which are to be applied to the subdivision and development of the subject land, including land use provisions, road pattern and infrastructure provision. These concepts have been developed as a result of a comprehensive environmental and heritage assessment of the subject area and surrounding land and detailed engineering site investigations into the suitability of the landform to support the uses now proposed. The ODP establishes design solutions and proposes management programs to address the identified issues.

The Plan reflects the outcomes of protracted consultation with the Department for Planning and Infrastructure, City of Gosnells, Department of Environment, Water Corporation, Main Roads WA and other servicing authorities as well as with local Aboriginal cultural and heritage custodians.

The concept plan now shown on the submitted ODP has been continually revised and improved over the past eight months as a result of the ongoing consultation processes and it is considered that the submitted plan now fully meets all of the requirements and the expectations of the approval authorities.

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Appendix 2: Laboratory Report - Groundwater Analysis

Appendix 3: ASS Field Log Results and WAPC ASS Risk Mapping

## 1.0 INTRODUCTION

### 1.1 Aims and Objectives

The objective of this Outline Development Plan (ODP) and associated Justification Report is to provide a clear understanding of the principles which are to be applied in the development of the subject land within the area which the City of Gosnells has identified as West Martin Precinct 1.

The objectives are based on sound planning, environmental, heritage, engineering, social and economic considerations. Specifically the aims and objectives of the Plan are:-

- To provide a design framework for the progressive and sustainable subdivision and development of the subject area, having regard to the policies of the City of Gosnells and the WA Planning Commission (WAPC), together with the policy requirements and services provision capabilities of the relevant government agencies.
- To provide for the optimum locations and appropriate uses for areas of Public Open Space (POS) and the creation of an appropriate and integrated road system which will optimise the legibility of the subdivision in terms of vehicular, pedestrian and cycle movement patterns and ensure maximum public accessibility, both visually and physically to the Canning River foreshore and Regional Open Space areas generally, having regards to frontage and access limitations imposed by the regional road network.
- To provide for a walkable residential neighbourhood which is sensitive to the physical attributes and exceptional landscape quality of the adjoining land, with a range of single residential lots and R30/R40 development sites which are appropriately sized for and appropriately located and designed to meet local market expectations and which reflect the principles of the Liveable Neighbourhoods Community Design Codes promoted by the WAPC and City of Gosnells and the Council's Safe City initiative and Housing Strategy.
- To provide for appropriate design solutions and best-practice urban water management and drainage of the subject area and the landscaped enhancement of the adjoining regional parklands, river floodplain and Conservation Category Wetland (CCW) system as appropriate.

### 1.2 Location and Description

West Martin Precinct 1 is situated in the suburb of Martin, within the municipality of the City of Gosnells. It is located only some 700 metres to the northeast of the Gosnells City Centre and 250 metres to the west of the intersection of Mills Road with the Tonkin Highway. The context of the subject area within the district, together with Precinct 2, is shown on the attached Plan 2.

The subject land is bounded generally by the proposed Precinct 2 subdivision to the northwest, Ferres Drive to the northeast and by the Canning River and regional parkland to the south and west. A narrow strip of the regional open space reserve separates Precinct 1 from Precinct 2.

Plan 2: West Martin Precinct 1 - Outline Development Plan District Context

The subject land is fairly flat being generally at a level of approximately RL15 to 16m AHD, although the western corner falls gently towards the river, where the level is at RL12m AHD at the boundary. Some shallow scouring has occurred in the northern and southern corners of the site.

There is a significant fall from the subject area, with the adjoining floodplain being substantially lower, being generally at around RL8m AHD. The Canning River, which flows northwards, is at level of approximately RL6m AHD.

The subject land was used for many years as an equestrian training facility. A dwelling, stables and various agricultural sheds are still located on the land, clustered in close proximity to each other and the house. A number of trees are to be found on the land, however, these would generally appear to be exotic species which were planted for their landscaping or screening value.

The subject two lots have recently been created, at which time those areas which are reserved as Parks and Recreation in the Metropolitan Region Scheme (MRS), were disposed of to the WAPC. Within the adjoining Precinct 2 area, some of the land areas reserved as Parks and Recreation in the MRS are yet to be acquired by the WAPC.

The MRS also defines Mills Road West and Ferres Drive as a 'Primary Regional Road' ("red roads") and defines areas of road widening which are required to be given up along the southern side of Mills Road West and the eastern side of Ferres Drive. However, all of the land required for road widening purposes within the Precinct 1 area was also recently transferred to the WAPC at the time Lots 830 and 831 were created.

A similar sized portion of land within the adjoining Precinct 2 is the subject of a concurrent ODP proposal, although additionally this proposal also includes a number of smaller lots located at the northern end of that Precinct, closer to Station Street. These latter have all have been developed in support of rural lifestyles and they support dwellings, with appropriate sheds, bores and landscaping.

One of the smaller lots within this area has been developed in part with orchard plantings and one of the dwellings is now occupied as a dental practice. The two lots which comprise the initial subdivision focus within Precinct 2 have been also previously been developed as equestrian training properties.

The Lumen Christi College is located on the opposite side of Mills Road West and a vacant, cleared area on the opposite side of Ferres Drive to Precinct 1, is now proposed as a commercial precinct and it is understood that negotiations with the Council in respect to this proposal are now well advanced.

The following aerial photograph, Plan 3, shows the local context and topographical features of Precinct 1 and the improvements which currently exist, in the context of the adjoining areas.

### 1.3 Ownership and Titles Description

The subject land, which is held in two separate titles has a combined area of some 10.48 ha. The land is described as being Lots 830 and 831 Ferres Drive, Martin, being C/T Vol 2591 Fol 585 and C/T Vol 2591 Fol 586 respectively, on DP44858.

Both lots are registered jointly in the names of Fairwater Pty Ltd and City High Investments Pty Ltd.

Plan 3: West Martin Precinct 1 - Outline Development Plan Local Context

## 2.0 STATUTORY AND PLANNING POLICY ISSUES

### 2.1 The Metropolitan Region Scheme

The land encompassed by the West Martin Precinct 1 ODP is zoned 'Urban' in the Perth Metropolitan Region Scheme (MRS), with portions of Mills Road West and Ferres Drive which are required for road widening purposes being reserved as a 'Primary Regional Road' together with the existing road reserves. As already noted, some of these areas were recently disposed of to the Crown at the time of the last subdivision.

The narrow strip of land situated between Precincts 1 and 2, together with the river floodplain to the west and south of the subject area is reserved for Parks and Recreation. These areas were also recently excised from the former landholdings at the time of the most recent subdivision.

The subject area is shown on the attached excerpt of the MRS, Plan 4.

### 2.2 The City of Gosnells Town Planning Scheme No.6

Under the City of Gosnells Town Planning Scheme No.6, the current 'District Scheme', all of the subject land together with the abutting land is zoned/reserved in conformity with the MRS, being specifically shown as 'Residential', 'Parks and Recreation' and 'Primary Regional Roads'. The subject area is shown on the attached excerpt of the TPS 6, Plan 5.

The Residential zoned area is shown with a density coding of predominantly R17.5, with pockets of R30. These zonings are historic and relate precisely to the old early 1990's subdivisional approval, the design of which would now be totally unsuitable.

To facilitate appropriate zoning for the current proposal, the Council resolved on the 28th February 2006, to initiate the rezoning of both Precincts 1 and 2 to "Residential Development". This is referred to as Proposed Amendment No.54.

Under the provisions of Town Planning Scheme No.6, the future "R-Coding" within the Residential Development Zone will be set by the two ODP's once they are adopted by the Council and endorsed by the WAPC. The R-Coding of the Precinct 1 ODP will therefore become established through this process.

### 2.3 Regional Planning Initiatives

The subject area has been zoned for urban/residential development for many years and accords with the various urban planning expansion initiatives which were conducted by the then State Planning Commission during the late 1980's and early 1990's with the objective of promoting appropriate urban expansion throughout the Metropolitan Area.

**Plan 4: Metropolitan Region Scheme**

Plan 5: City of Gosnells - Town Planning Scheme No. 6

### 2.3.1 Liveable Neighbourhoods Community Design Codes

The Liveable Neighbourhoods Community Design Codes was published by the WAPC in June 2000. It represents the most significant urban design initiative ever in WA. Together with the various policy design guidelines (the DC Policies) also published by the WAPC, Liveable Neighbourhoods establishes the core parameters for subdivision design and approval assessment processes in Western Australia.

The stated purpose of Liveable Neighbourhoods is to assist in the implementation of the objectives of the State Planning Strategy which aim to guide the sustainable development of WA, by creating a development control system which facilitates the development of sustainable communities.

While the introduction of Liveable Neighbourhoods was intended to supersede the earlier issues-based DC Policies, in practice the adoption of Liveable Neighbourhoods has tended to be implemented in conjunction with the DC Policies which have, in general remained operative.

In addition to introducing and encouraging the elements of "new urbanism" into the urban design of development projects, Liveable Neighbourhoods also attempted to introduce a parallel subdivision approval assessment process which depended to a large degree on self-assessment, which was intended to replace the older system. In practice however, this process was found unduly complex and wanting by developers and town planners and has generally been avoided.

The enduring outcome of Liveable Neighbourhoods has been a wholly different mindset within the WA development industry, in undertaking subdivision design by focussing on a whole range of community based issues to create developments which are responsive to those issues.

## 2.4 Local Planning Initiatives

### 2.4.1 Outline Development Plans

The subject area is included within the West Martin Outline Development Plan (ODP) which has initiated by the City of Gosnells in 2003. The ODP identified a number of 'Precincts' within the West Martin area which are being considered for various densities of urbanisation.

The Council resolved in 2003 that future more detailed planning and the eventual development of the various Precincts in the ODP will be undertaken on a staged basis. The Council resolved at that time that it would progress the planning and subsequent development of Precincts 1 and 2 through the process of more detailed ODP's for each Precinct and that because of the unique zoning status and prior planning history of these two areas, the Council also resolved to progress the planning of these Precincts in advance of the remaining areas.

Little planning has so far been undertaken in respect of Precincts 3 - 6, owing to a number of factors, not the least of which is the multitudinous ownership nature of these areas and at this time the Council continues to evaluate staging options in respect of the remaining Precincts.

Owing to the existing urban zoning and prior planning history of residential subdivision approval and the lack of significant planning or environmental issues impacting the Precinct 1 and 2 areas, it was considered appropriate in 2003 that the preparation and approval of the Precincts 1 & 2 ODP's should be undertaken concurrently with the overall West Martin ODP and Council endorsed this process.

As noted earlier an ODP for Precincts 1 and 2 which was initiated in 2003 has lain dormant and following ownership changes in respect to all four core allotments, the also ODP will now be superseded by the current proposals.

#### **2.4.2 Safe City Policy**

Under the auspices of the Council's broad based Strategic Plan 2000, the City prepared and adopted the SafeCity Urban Design Strategy in 2001. This groundbreaking document addresses a range of global objectives for minimising the opportunities for street crime in Gosnells and for generally improving and enhancing the "liveability" of Gosnells as an urban community.

A critical part of the Strategy is the "designing out" of opportunities for street crime and crime in public spaces generally, through adherence to a range of prescribed urban design guidelines. These are intended to maximise the visibility of buildings, streets and public spaces and to enhance "natural surveillance" in areas which may otherwise become more vulnerable to crime.

#### **2.4.3 Local Housing Strategy**

The current City of Gosnells, Local Housing Strategy was adopted by the Council in December 2003 but is yet to be endorsed by the WAPC.

The stated aim of the Strategy is "to provide strategic direction to meet future housing needs within the City by identifying areas that have the capacity to accommodate increased residential densities in order to cater for population growth and change."

The Strategy states that the intention of the document is to contribute to a more sustainable form of residential development by facilitating more compact residential areas, which make more efficient use of infrastructure and to achieve this the Strategy foresees some of the key issues being accessibility to services, the promotion of diverse housing options and the adherence generally to the Liveable Neighbourhoods principles.

## 3.0 ENVIRONMENTAL MANAGEMENT

This section describes the key environmental features of the site, the design principles used to guide site layout, management of key environmental issues and opportunities to provide a net environmental benefit from this project.

### 3.1 Introduction and Proposal Overview

A description of the existing site conditions is provided below. The proposal involves development of approximately 110 residential lots and 2 areas of group housing, together with a road and cycleway network, Public Open Space areas, stormwater management zones, wetland buffer areas and key rehabilitation zones.

The key environmental features and planning opportunities of the proposal are:

- removal of existing agricultural uses;
- removal of extensive weed seed source;
- establishment and rehabilitation of buffer between the development area and Canning River and tributary;
- treatment of stormwater run-off from site and discharge of treated stormwater to Canning River to maintain flow volumes;
- treatment of stormwater run-off from public roads (outside of development area) to improve water quality prior to discharge to Canning River; and
- improved management of the Parks and Recreation areas adjacent to the site to improve habitat value, aesthetics and appropriate recreational opportunities.

### 3.2 Existing Environment

#### 3.2.1 Landform, Topography and Soils

The majority of the site is relatively flat at approximately 15 - 16 mAHD, falling away towards the Canning River to the south and west and the tributary to the north-west (Plan 6). Outside of the property boundary the land falls steeply to the flood zone of the river and tributary. The boundary of the 1 in 100 year flood zone is shown in Plan 7.

The soils and landforms in this area are mapped as *Swan* and described as "alluvial terraces with red earths and duplex soils" (Churchward and McArthur, 1978) which is consistent with the on-site investigations showing clays and sandy clays.

WAPC ASS risk mapping across the site shows no 'high risk' AASS or PASS areas within 3m of the surface. The site is classified as 'moderate to low risk'.

**Plan 6: Site Topography**

Plan 7: Flood Zone

### 3.2.2 Wetlands, Surface Hydrology and Drainage

Lots 830 and 831 are entirely within a dampland classified as Multiple Use by the Department of Environment (Hill *et al.*, 1996). The management objective of Multiple Use Category wetlands are to use, develop and manage wetlands in the context of water, town and environmental planning (Hill *et al.*, 1996). The site is also adjacent to the Canning River and a tributary of the Canning River, both of which are classified as Conservation Category Wetlands (WALIS, 2002). The objective of management of Conservation Category wetlands is to preserve wetland (natural) attributes and functions (Hill *et al.*, 1996). The wetland mapping is shown in Plan 8.

There are no Environmental Protection Policy (EPP) wetlands identified within the site. However, the Canning River is protected through the *Environmental Protection (Swan and Canning Rivers) Policy 1998*. The purpose of the EPP is to ensure that the values of the Swan and Canning Rivers are restored, maintained and protected by managing the activities that affect them (EPA, 1998).

Several other drainage lines cross the site, receiving stormwater run-off from Ferres Drive and Mills Road prior to discharging untreated to the Canning River. The locations of these drainage lines are shown in Plan 8.

### 3.2.3 Groundwater

No published Average Annual Maximum Groundwater Levels (AAMGL) were available for this site, however on-site investigations and historical data from neighbouring properties suggests the depth to groundwater across the site varies from 0.5m to 5m.

Rainfall data available from the Bureau of Meteorology shows that July to December rainfall for 2005 was very similar (within 50mm) of rainfall figures for the same period during 2002 - 2004 (BOM, 2006). Groundwater data collected over 2005 from other projects in the Perth metropolitan region show maximum groundwater levels for 2005 were reached in September / October. Graph 1 shows the groundwater levels across the development site from September 2005 to January 2006. These results are consistent with maximum groundwater levels being reached in Sept / Oct (as levels begin to fall after this time in all bores in the superficial aquifer). Therefore it could be assumed that the groundwater results for September are representative of AAMGLs for the development site, which range from 7.7 to 19.4 mAHD.

The results of groundwater level monitoring are attached in Appendix 1. Inferred AAMGL groundwater contours based on the data collected are also included in Appendix 1.

Groundwater quality analysis has been undertaken to provide an indication of background groundwater quality for the area. The results of the groundwater sampling and sampling locations are included in Appendix 2. The results showed high levels of Total Phosphorus in bores M2 and M3 (770 µg/L and 320 µg/L) and high levels of Total Nitrogen in bores M3, M4 and M5 (1600 µg/L, 5600 µg/L and 2800 µg/L). Elevated nutrient levels in groundwater are likely a result of historical agricultural use in the area.

### 3.2.4 Flora and Vegetation

The site has been used as a horse stud and has been cleared of native vegetation to the fence line (Plates 1 and 2). Some shade trees and exotic ornamentals have been planted in and around the existing house and consideration has been given to the retention of as many of these trees as possible. In practical terms however, owing to the need for significant earthworking and general need for filling over much of the site, it has been determined that only a few of the existing trees can be retained within the public open space area.

**Plan 8: Wetland Mapping and Drainage Lines**

Bush Forever Site 246, which incorporates the Canning River, borders the southern, western and northern boundaries of the site (Government of Western Australia, 2000), refer to Plan 9. There is extensive weed invasion within the Bush Forever Site adjacent to the property and down to the edge of the river. Weed species include bamboo, Japanese Pepper Tree, Arum lilies, citrus trees and a variety of exotic grasses. Little native understorey species remain on the banks of either the Canning River or its tributary (Plates 3 - 5).

The type of upland vegetation communities that are likely to have occurred on site prior to clearing include low open forest dominated by *Banksia attenuata*, *B. menziesii*, *B. ilicifolia*, *Allocasuarina fraseriana*, and *Eucalyptus todtiana* and combinations of these (Government of Western Australia, 2000).

Vegetation communities on the wetlands (or wet flats) that occur closer to the river (out of the development area) are described in Bush Forever (Government of Western Australia, 2000) as *Eucalyptus rudis* and *Melaleuca raphiophylla* open to closed forest over *Astartea fascicularis* and *Grevillea diversifolia*, *Corymbia calophylla* open to closed forest, *Eucalyptus rudis* and *C. calophylla* open to closed forest.

### 3.2.5 Fauna and Habitat

Given the condition of vegetation on-site there is considered to be little habitat value remaining. The mature exotic trees may provide roosting and nesting opportunities for birds in the area, however there are extensive areas of mature native species in the vicinity that provide similar habitat value.

Areas of long grass near the water courses may provide Quenda habitat, however given the proximity to existing residential areas and lack of thick protective understorey it is unlikely that a permanent Quenda population could be sustained in the area. No evidence of Quenda or other native animal tracks were noticed during several site inspections.

### 3.2.6 Aboriginal Heritage

The Canning River and all of its tributaries are identified as Aboriginal Heritage sites on the Department of Indigenous Affairs database. Consultation and suitable resolution has been reached with the relevant Aboriginal representatives. The current subdivision design reflects the agreement reached.

### 3.2.7 Recreational Use

The area is currently privately owned and consequently public access is restricted. Controlled, low impact access adjacent to and overlooking the river area will provide a significant public asset in an area that has the potential to be a high quality scenic recreational area.

**Plan 9: Bush Forever Boundaries**

### 3.3 Impacts and Management

#### 3.3.1 Design Principles

Development of the site is seen as an opportunity to provide a high quality urban subdivision within a setting that is unique in metropolitan Perth, with gently undulating land providing vistas to both the Darling Scarp and across the Canning River with only minutes to major road and rail transport networks. The key principles driving the design include:

- Maximise public access to the river environment for compatible, low impact uses.
- Provide quality development areas that best benefit from the unique environmental setting.
- Provide a net environmental benefit to the Canning River and its key environmental values.

#### 3.3.2 Wetland / River

The Department of Environment's stated position on development setbacks to Conservation Category wetlands is a minimum of 50m. This is to provide protection of the wetland values which have been categorised by Bowen, Froend and O'Neil (2002) as:

- Uniqueness.
- Naturalness.
- Habitat or collective attributes.
- Scientific attributes.
- Recreational attributes.
- Aboriginal.
- Cultural/heritage.
- Educational.

The design of this site has been configured to maintain or improve the key environmental values associated with the Canning River in this location through the use of not only separation distance buffers but also access restriction to sensitive areas, vegetation and habitat rehabilitation, stormwater capture and treatment and encouraging passive surveillance of publicly accessible areas.

Essential Environmental Services (2004) prepared a report defining a process for the protection of wetlands on the Swan Coastal Plain by identifying the wetland attributes, threatening processes, and appropriate separation measures. This process was applied to the Ferres Drive site and summarised below.

#### 3.3.3 Process for Determination of a Wetland Buffer

##### Step 1 Acknowledge the Existence of Wetland

The Canning River and the tributary running north of the site are both recognised as lotic wetland systems that are adjacent to but outside of the development area.

### Step 2 Identify Wetland Attributes, Wetland Management Category and Establish Management Objective

The management category for the Canning River and tributary is Conservation. The Canning River's natural attributes and functions in this area, as described in Bush Forever (Government of Western Australia, 2000), are described below<sup>1</sup>:

- Part of significant regional riverine wetland system.
- Moderate habitat diversity (although generally degraded).
- Supports wetland fringing vegetation.
- Part of a regionally significant contiguous bushland/wetland linkage and wildlife corridor.
- Likely roosting, nesting site for birds.
- Significance to Aboriginal culture.
- National Trust of Australia (WA) Classification.
- Visual amenity of open water.
- Provision of floodway drainage.
- Receives road and catchment drainage.

### Step 3 Define Wetland Function Area

The key functional attributes that may impact on definition of the function area include the 100 year flood zone and the Floodway Limit (refer to Plan 7) and the extent of the wetland dependent vegetation. The wetland dependent vegetation immediately adjoining the development site has been determined by mapping and ground truthing using a hand-held GPS. The results are shown in Plan 10.

Based on the above key attributes, the Wetland Function Area adjacent to the development site is shown in Plan 11.

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<sup>1</sup> Note. These attributes and functions are not necessarily present within the proposed development site.

**Plan 10: Extent of Wetland Dependant Vegetation**

**Plan 11: Wetland Function Area**

Step 4 Identify Threatening Processes

The main threatening processes for the attributes identified in Step 2 from the existing and proposed land uses are shown in Table 1.

**Table 1: Identification of Key Threatening Processes**

Land Use	Key Threatening Process			
	Alterations to the water regime	Habitat modification	Inappropriate recreational uses	Alteration to water quality
Equestrian activities / rural (current)	<ul style="list-style-type: none"> <li>• Land clearing and scouring from sheet flow.</li> <li>• Drainage to minimise flooding</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of vegetation</li> <li>• Introduction of exotic flora and fauna</li> <li>• Over grazing</li> <li>• Loss of fringing vegetation and erosion from stock trampling</li> </ul>	<ul style="list-style-type: none"> <li>• Vegetation damage and bank erosion from recreational activities in sensitive areas.</li> </ul>	<ul style="list-style-type: none"> <li>• Pesticides and fertilisers</li> <li>• Sedimentation</li> <li>• Hydrocarbon run-off</li> <li>• Nutrient enrichment of groundwater</li> </ul>
Urban/ Residential (proposed)	<ul style="list-style-type: none"> <li>• Water table rise through reduced rainfall interception and higher induced recharge</li> <li>• Use as drainage compensating basis</li> <li>• Groundwater abstraction lowering water levels</li> <li>• Reduced drying cause of loss of aesthetic value of water body</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of fringing vegetation to provide aesthetic views</li> <li>• Encroachment to achieve maximum commercial returns</li> <li>• Uncontrolled access trails impact vegetation</li> <li>• Traffic noise</li> <li>• Weed infestation</li> <li>• Feral and domestic animals</li> </ul>	<ul style="list-style-type: none"> <li>• High population pressures</li> <li>• Rubbish disposal</li> </ul>	Stormwater and drainage discharges carrying nutrients and inorganic and organic pollutants

Step 5 Identify Role of Separation Measure

Separation is one of a range of measures that can be used to protect wetland attributes from threatening processes. By identifying the role of the separation requirement the most appropriate management of the relevant threatening process can be identified.

**Table 2: Identification of the Role of the Separation Requirement in Addressing Threatening Processes**

<b>Threatening Process</b>	<b>Role of the Separation Requirement</b>
Alterations to the water regime	<ul style="list-style-type: none"> <li>• Reduces rates of peak surface (unchannelised) flow and potential for erosion.</li> <li>• Increases interception and evapotranspiration, reducing excessive flooding.</li> <li>• Vegetated wetland fringes may affect the water regime through increasing evapotranspiration losses from the groundwater system supporting the wetland and assist in bank stabilisation maintaining river bed width.</li> </ul>
Habitat modification	<ul style="list-style-type: none"> <li>• Vegetated buffers are valuable in minimising disturbance to the wetland and reducing potential for colonisation by exotic species.</li> <li>• Fencing the perimeter of the buffer can assist in reducing access to the river and banks by exotic terrestrial vertebrate fauna.</li> <li>• Adds to and maintains wildlife habitat of a wetland.</li> <li>• Firebreaks / roads reduce potential for increased frequency of fire.</li> </ul>
Inappropriate recreational activities	<ul style="list-style-type: none"> <li>• Vegetated buffers can be used to enhance the aesthetics of riverine environment, encouraging people to value and protect the area.</li> <li>• Provides barrier to visual and noise pollution.</li> <li>• Minimises public access and activities in certain sensitive areas.</li> </ul>
Alteration to water quality	<ul style="list-style-type: none"> <li>• Vegetated buffers may assist in the reduction of nutrient inputs to wetlands through increased uptake and assimilation of surface and subsurface water-borne nutrients.</li> <li>• Reduces unchannelised surface water flow rates, allowing suspended material to settle prior to drainage to river.</li> <li>• Provides for management of drainage inputs.</li> <li>• Can assist in reducing the dispersal and impact of midges on surrounding areas.</li> </ul>

#### Step 6 Establish Separation Requirement

Separation distances that are intended to mitigate the threatening processes are recommended in EES (2004). The recommended separation distances for Conservation Category wetlands are provided below together with alternative management measures that may fulfil the role of the separation requirement with a reduced separation distance.

Table 3: Recommended Separation Measure and Alternative Management Options

Threatening Process	EES Recommended Separation Measure	Alternative Management Measures Proposed in this Development
Alterations to the water regime	<ul style="list-style-type: none"> <li>• Drainage inflows eliminated or managed.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of Best Practice in Water Sensitive Urban Design to minimise peak flows.</li> <li>• Trap currently uncontrolled road run-off and treat / infiltrate prior to release.</li> <li>• Rehabilitation of river banks with deep rooted natives to provide better stabilisation and habitat.</li> </ul>
Habitat modification	<ul style="list-style-type: none"> <li>• 100m weed infestation.</li> <li>• 6-50m firebreak.</li> <li>• Fence for controlling exotic fauna access.</li> <li>• 100m to minimise edge effects.</li> </ul>	<ul style="list-style-type: none"> <li>• Currently pasture grasses are maintained to edge of boundary fence. Removal of paddocks and rehabilitation of buffer and 'weed fence' will provide significantly improved outcomes.</li> <li>• Firebreak to housing is catered for through road and DUP separation.</li> <li>• A fence on edge of buffer will prevent dogs and reduce human access to sensitive areas.</li> <li>• Current edge effect pressures of horses, grass weeds and uncontrolled drainage will all be removed, 100m separation is unnecessary.</li> </ul>
Inappropriate recreational activities	<ul style="list-style-type: none"> <li>• 50m for improving aesthetics.</li> <li>• 50m for barrier.</li> <li>• Fence, paths for controlling access.</li> </ul>	<ul style="list-style-type: none"> <li>• Aesthetics improved by rehabilitating buffer area and providing controlled public access and viewpoints. Proposed buffer rehabilitation areas shown in Plan 12.</li> <li>• Barrier against inappropriate recreational activities provided by fencing, provision of path and rehabilitation to prevent active recreational activities. 50m barrier not required with proposed management measures.</li> <li>• Fencing and paths will be provided, refer to Plan 12.</li> </ul>
Alteration to water quality	<ul style="list-style-type: none"> <li>• Drainage flows eliminated or managed.</li> <li>• Where a proposal may affect wetland water quality, particularly through unchannelised flow, detailed site specific work should be undertaken to determine the specific separation measures required, including management measures.</li> </ul>	<ul style="list-style-type: none"> <li>• Water Sensitive Urban Design principles will be used in internal drainage design to minimise need for 'end of pipe' treatment. Greater than 1 in 1 year flows will be treated prior to discharge to the tributary. Off-site road run-off (currently untreated) will be captured and treated in 'living stream' prior to discharge to the river. Refer to Plan 12.</li> </ul>

#### Step 7 Apply Separation Requirement to Proposal and Assess Ability of Separation Measure to Achieve Management Objective

In identification of suitable separation measures, EES (2004) states:

"If the required separation measures are unachievable, i.e. the recommended separation distance cannot be achieved around the whole Wetland Function Area or the recommended management measures are unable to be implemented, an assessment of what is actually achievable is required. If it can be clearly demonstrated that the achievable Separation Measures will ensure that the appropriate wetland Management Objective is met, proceed with the proposal".

Plan 12: Environmental Design

Through the management measures identified in Table 3 and described in more detail below, the key threatening processes can be managed such that the attributes and functions of the river in this location will be maintained or improved through the long term.

#### Weed Invasion

The river banks and fringing vegetation are heavily weed infested throughout as a result of past land uses. Application of a standard 100m separation distance between the wetland function area and the development would have no effect, as most of the sources of weed infestation are within the wetland itself. As a more appropriate management response, the current weed source from the paddock areas will be removed as a result of this development. The extensive weed infestation within the banks of the tributary and the Canning River in the vicinity of the development area will be subject to eradication and rehabilitation to reduce the potential for reinfestation in the future. An exclusion fence will be put in place along the perimeter of the rehabilitation area and will incorporate weed and exclusion barrier along the base to ensure wind blown seed from gardens is not transported into this area.

#### Firebreak

The requirement for a firebreak will be achieved through the installation of a Dual Use Path that will follow the edge of the rehabilitation area and the road, which also separates the developed area from the natural area (with the exception of two proposed group housing areas and a group of 10 lots along the south eastern property boundary). The installation of fencing will also assist in keeping people and dogs out of the sensitive areas reducing the potential for deliberate or inadvertent lighting of fires.

#### Edge Effects

The default separation distance given by EES (2004) to manage potential impacts from edge effects is 100m. With the key pressures leading to edge effects in this location being horses, weeds, uncontrolled drainage and people pressure through sensitive areas, management of these issues is seen as a better alternative. Grass and weeds will be controlled as described above, horses will be removed from the property and the installation of dual-use paths (DUPs) and fencing will serve to direct people away from sensitive areas. A POS area incorporating turf is provided in the eastern end of the estate.

#### Water Quality

To protect against alteration to water quality, it is recommended in EES (2004) that drainage flows be eliminated or managed, and site specific work undertaken to determine the specific separation and management measures required. Throughout the estate the principles of Water Sensitive Urban Design will be incorporated to minimise the volume and pollutant load of end-of pipe-stormwater that will require moderation and treatment. 1 in 1 year ARI events will be treated and infiltrated within the estate and swales and greater than 1 in 1 event will overflow to the tributary and wetland after flow reduction has reduced sediment loads and nutrient stripping has occurred. This will allow clean water to continue to supplement Canning River flows.

Off-site, it is proposed to develop a 'living stream' in the currently unmanaged, degraded Bush Forever area to the south of the development area, within the Canning River flood zone. This system will receive stormwater from Ferres Drive and Mills Road and treat it to remove sediments and remove nutrients prior to overflow to the Canning River. This provides a greater level of protection and water quality than the currently uncontrolled direct flow into the river.

The development edge along the western boundary of the site roughly follows the 14m contour line which provides approximately 7m vertical separation to the Canning River (during normal flows) and is the height at which the land begins to flatten out and so provides a logical separation between the riverine, riparian and upland environment and the development area. Similarly, bordering the tributary the 'crest' of the embankment was a key determinant of the development edge as the main threatening processes could be managed through other mechanisms. Along the southern edge of the site the cadastral boundary largely follows the crest of the embankment down to the flood zone, which provided a separation distance of between 50m and 130m from the wetland dependant vegetation.

#### 3.3.4 Flora and Vegetation

There are no Bush Forever sites within the project area however the site is bordered to the south, west and north by Bush Forever Site 246 which encompasses the Canning and Southern Rivers from Beckenham to Martin/Kelmscott.

The condition of the vegetation across the entire site is consistent with its historical rural use (cleared open grass paddocks with some shade and ornamental trees) and holds little environmental value. No flora survey has been conducted across the site.

Vegetation associated with the Canning River and its tributary, including banks and river flats, consists of an overstorey of mature Melaleuca and Eucalypt trees with highly degraded, weed infested and in some parts eroded understorey dominated by exotic grasses. As part of this development it is proposed to rehabilitate approximately 7,000m<sup>2</sup> of development area and up to 25,000m<sup>2</sup> of the degraded Parks and Recreation zoned land adjacent to the development site, including the development of living stream wetlands. A program of weed control and local native tube stock planting will be implemented progressively to ensure erosion and scouring does not result over the winter period. A Rehabilitation Management Plan will be prepared that details the extent and schedule of works, species, densities etc that will be used in rehabilitation.

#### 3.3.5 Fauna

Bush Forever (Government of Western Australia, 2000) suggests that the Quenda may occur in this region, and other small fauna are likely to occur. Prior to any clearing of the development area, a Fauna Management Plan will be prepared that:

- Identifies likely significant Quenda habitat areas.
- Details appropriate strategies for ensuring no Quenda are present prior to commencement of earthworks. For example, removing remaining fencing and slashing long grass close to the property boundary prior to earthworks commencing to allow any remaining fauna to move to the buffer area.
- Identifies any other significant species likely to occur on site with appropriate management arrangements. For example provision of 'habitat logs' or nesting boxes to encourage native species to re-establish in the area. An education pack will be provided for new residents about the need to control cats and dogs when living close to sensitive habitat areas.

#### 3.3.6 Drainage and Stormwater Control and Treatment

Currently drainage from the subject area, together with run-off from parts of Mills Road and Ferres Drive flows across the site and adjacent Bush Forever site to the Canning River and the tributary which is situated between Precincts 1 and 2, untreated and generally uncontrolled.

Drainage from Lumen Christi College and from further eastwards also flows through the area, particularly within the tributary. In addition to properly addressing the drainage of the subject area and relevant parts of the abutting Parks and Recreation reserve, the proponent will consider, in conjunction with the Precinct 2 proponent and in consultation with the Water Corporation, DoE and Council, the drainage issues which impact the proposal.

In initial discussions with the Department of Environment, it was advised that capture, treatment and infiltration of up to the 1 in 1 Average Recurrence Interval (ARI) storm was appropriate. Larger storm events should be allowed to discharge to the tributary / river after treatment for sedimentation to maintain healthy river flows. Therefore it is proposed that a living stream treatment swale be created to capture, treat and infiltrate the 1 in 1 ARI event from the site. Larger events will be drained through the living stream to remove sediments and promote nutrient removal prior to discharge to the tributary (refer to Plan 12). The living stream design will be consistent with the rehabilitation work being undertaken in the buffer area and will look and function as a continuation of the natural wetland elements of the site.

Within the estate the principles of Water Sensitive Urban Design will be followed where possible. At source infiltration will be restricted in some areas due to the clayey nature of the site and the pressure head from the artesian aquifer causing water discharge at the surface.

Gross Pollutant Traps will also be used prior to discharge to the living stream to capture most litter and sediments before they reach the treatment system.

A Drainage and Nutrient Management Plan will be prepared that provides detailed design of the living stream system and stormwater management system and incorporates the principles and objectives of the *Stormwater Management Manual for Western Australia* (DoE, 2004).

### 3.3.7 Managed Open Space Parkland

To provide an additional environmental benefit from the proposal it is proposed to develop a living stream system in the cleared Bush Forever site adjacent to the south of the development area. This system will be used to treat stormwater run-off from Ferres Drive which currently drains untreated to the Canning River. The system may also accept some small volumes of run-off from the southern end of the development area. This site is currently unmanaged and is parkland cleared, consisting of grass weeds. The site currently gets waterlogged after rain and forms part of the floodway of the Canning River. This proposed use is believed to be consistent with floodway management as it will not restrict floodwater flows and when plants are established the system should be resistant to periods of inundation and severe scour from floodwaters. Conceptual design of the living stream system is shown in Plan 12. Detailed design of this system will be included in the Drainage and Nutrient Management Plan.

### 3.3.8 Acid Sulphate Soils

The Western Australian Planning Commission's (2003) *Planning Bulletin No. 64 Acid Sulfate Soils* identifies the site as 'moderate to low risk of AASS (Actual Acid Sulfate Soils) and PASS (Potential Acid Sulfate Soils) occurring generally at depths of greater than 3m'. Field testing was undertaken to provide an indication as to whether ASS may be present on site (Field logs and WAPC ASS Risk Mapping are provided in Appendix 3). Although the peroxide oxidation tests were highly reactive in some samples, the high final pH reading suggests this is a result of high organic content rather than from ASS or PASS. More detailed investigations are planned.

Most of the site will require clean fill to be brought in to raise the ground level and provide necessary clearance to groundwater and sufficient site stability. As a result it is likely that installation of sewerage and other services can be accomplished without disturbing any acid sulphate soil and without any need for dewatering. If dewatering is subsequently found to be necessary, an application for dewatering will be lodged with the DoE together with an ASS investigation report and Operating Strategy.

More detailed field and laboratory assessment will be undertaken when finished lot level heights and final sewerage line alignment are planned. It is anticipated that ASS assessment would form a condition of subdivision and would be appropriate at that stage.

### 3.3.9 Groundwater

Groundwater monitoring across the site shows the depth to groundwater varies between 5.8m below ground level to 2.0m above ground level (due to hydraulic head pressure from confined aquifer). The groundwater level monitoring results and interpretation of AAMGLs across the site are included in Appendix 1.

The majority of the site will require filling to provide geotechnical stability for residential construction. Although unlikely, it is possible that the installation of sewers may require excavation below the groundwater level and hence dewatering may be required. If dewatering is found to be necessary then a groundwater abstraction licence application will be submitted to the Department of Environment for assessment, which will include Acid Sulphate Soil investigation and development of an Operating Strategy to manage any potential drawdown impacts.

As part of the groundwater sampling it was found that the superficial aquifer in the vicinity of bore M1 in the northern area of the site was under hydrostatic pressure and produced a free groundwater level (at AAMGL) of 2.0m above ground level. This is likely to be a result of a confining layer of mud/shale preventing surface discharge when rainfall recharges groundwater flow from the nearby scarp. A diagrammatic representation of the confined aquifer leading to surface discharge is provided in Plan 13. Bore installation breached the confining layer and groundwater under pressure was released at the surface before the bore was sealed to prevent uncontrolled water discharge. By January the hydrostatic head had declined to 0.05m above ground level, suggesting that the pressure in the aquifer has significant seasonal variability and would not necessarily have the potential to produce surface discharge all year. Groundwater at bore M1 was intersected at 6.5 metres below ground level (mbgl) (approximately 9mAHD), so it is likely that this aquifer discharges to the Canning River, which is at approximately 7mAHD.

During groundwater investigations a second, shallower series of bores (the "B" series) was installed at most sites to look for evidence of groundwater perching above the confining clay layer. Groundwater in these bores was intersected at depths of between 0.7m and 2.4m bgl. The difference in EC readings between M2A and M2B; M4A and M4B; M6A and M6B and the similarity with bores M5A and M5B; M7A and M7B suggests the presence of an intermittent confining layer with significant areas of connectivity between the two aquifers. All shallower bores were dry by January 2006, suggesting that any perched aquifer is likely to be strongly influenced by seasonal rainfall. This would correspond with the dampland status of the site.

Management of groundwater during construction and installation of services such as sewer pipes will need to have consideration of local groundwater conditions. As discussed previously, the majority of the site will require fill so the extent of excavation into the natural ground is likely to be minor. If dewatering is necessary, an application will be submitted to the DoE.

**Plan 13: Diagrammatic Representation of Confined Aquifer Leading to Surface Discharge**

### 3.3.10 Aboriginal Heritage

The Canning River and all of its tributaries are recognised as significant mythological sites to the Aboriginal people and are included on the Department of Indigenous Affairs database. Consultation with the relevant Aboriginal representatives has been undertaken and a suitable development exclusion zone has been agreed to prevent damage or degradation to the heritage values. The subdivision layout has been designed to accommodate these requests. Rehabilitation works are considered an acceptable activity within the development exclusion area.

The proponent is aware of its obligations under the *Aboriginal Heritage Act 1972*. In the event that Aboriginal material is uncovered during site works, work in that area will immediately cease and the discovery will be reported to the relevant authorities. Project personnel will be informed of the requirement of the *Aboriginal Heritage Act 1972* with regards to interference with Aboriginal sites.

### 3.3.11 Public Access and Amenity

A range of public recreational facilities will be provided within the estate. Dual use paths will be installed around the edge of the buffer area to provide a hard edge between the rehabilitation and landscaping and minimise weed encroachment.

A recreation area will be provided within the estate to allow for more active recreation away from sensitive rehabilitation and wetland areas.

Approximately 800m of river vistas will be opened up for public enjoyment in an area that is currently difficult to access due to private ownership.

## 3.4 Conclusions

The proposed development has been designed in consultation with the developers of the lots to the north of the tributary who are at a similar stage of planning. The design principles, setbacks, rehabilitation plans and drainage systems have been designed to be consistent between the two developments. As a result the two developments will return to the public up to 1.4 km of river front (800m from this development) that has been excluded due to private ownership for many decades. In addition the currently degraded vegetation communities on the sensitive river banks will be rehabilitated to provide an improved environmental outcome. A Rehabilitation Management Plan and Fauna Management Plan will be developed.

The current attributes of the riverine system will be protected through measures such as fencing, rehabilitation, improved drainage treatment and removal of existing threatening activities such as equestrian activities, paddocks as a major source of weed spread and management neglect. These measures will provide for the protection of the identified attributes and functions of the Canning River in this location without the need for an arbitrary 50m setback around the whole site.

Although no high risk ASS areas were identified on-site, further detailed ASS investigations will be conducted when finished lot levels, sewerage alignment, any dewatering requirements etc have been more accurately determined to allow better targeted investigations.

To provide an additional environmental benefit to the Canning River system, the developer will provide a stormwater treatment system that will remove sediments and assist in nutrient stripping to treat road run-off from Ferres Drive and Mills Road. This will be installed in the currently unused Parks and Recreation zoned land to the south of the development area. While providing a useful service in treating road drainage prior to flowing to the Canning River, it will also provide an aesthetically pleasing landscape feature to a site that is otherwise unmanaged and neglected. A Drainage and Nutrient Management Plan that provided detailed design and performance criteria will be developed.

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## 4.0 PRECINCT 1 OUTLINE DEVELOPMENT PLAN

### 4.1 Overview

The Precinct 1 Outline Development Plan (refer Plan 14) has been prepared to provide a framework for the co-ordinated and sustainable subdivision and development of the subject land, recognising State government and City of Gosnells policy requirements and is based on state of the art environmental objectives, the sustainable and community based urban design principles encapsulated in the Liveable Neighbourhoods Community Design Codes, SafeCity Urban Design Strategy principles and the required engineering standards.

In mid 2004, the City of Gosnells in conjunction with the West Martin Consultation Group (a local landowner representative committee) hosted a series of landowner workshops which were attended with great interest by a number of local landowners from within the wider West Martin area. The workshop proceedings and outcomes were summarised in a report West Martin Workshop Outcomes Report - July 2004, which was produced by the City.

The key outcome resolution which affects the ODP Area is that which supported the Council initiated Outline Development Plan for West Martin, which defined the proposed seven precincts, of which it was recognised that Precincts 1 and 2 were special cases, as the subject areas are already zoned for urban/residential development and have been the subject of earlier subdivision approvals.

As by mid 2004 the planning of Precincts 1 and 2 was at a considerably more advanced stage than the other precincts, the workshops were more focussed on identifying and establishing the shared community values and the desired outcomes for the future planning of Precincts 3 to 7 and these were the subject of a number of specific identified goals which were set out in the report.

Giving priority to the planning of Precincts 1 and 2 was a supported outcome of the workshops.

In the course of developing the Plan, particular regard has been given to the need to suitably address interface issues between the various West Martin Precincts as this has been identified as a significant issue of community interest. The subject area is situated opposite the Lumen Christi College, a fairly significant landholding and with the exception of the Precinct 1 area, the subject area is significantly removed from the other areas likely to be developed and will have little if any impact on them.

The Precinct 1 Outline Development Plan provides an overall context to ensure that the detailed design and development of the landholding can proceed in an acceptable, logical and sustainable manner, once the ODP is adopted by the City of Gosnells and endorsed the WAPC.

### 4.2 Design Principles

The design of Precinct 1 generally accords with the Liveable Neighbourhoods Community Design Codes and the SafeCity Urban Design Strategy principles which are actively promoted by both the City of Gosnells and the WAPC.

In regard to the Liveable Neighbourhoods principles the design does however, have regard to the limiting factors imposed by the overall shape and orientation of the site, which precludes the adoption of solar principles in relation to lot orientation which are an aspect of the Codes.

The following principles have been specifically recognised in the design concept:-

- An overall layout which recognises the physical nature of the site and the unique location and landscape perspective of the subject area, particularly in relation in its context with the Canning River and adjoining floodplain system, the extensive vegetational backdrop, and also the contextual relationship with the Darling Range escarpment in the middle distance.
- A modified grid based street network, to ensure maximum permeability and legibility of the road pattern, and to promote pedestrian and cycle safety and movement, adapted to suit the overriding requirement for peripheral roads in most parts of the Precinct, which are needed to maximise public and resident accessibility to the regional parklands, while recognising the non-rectilinear nature of the subject area.
- An appropriate interface with the abutting “red roads” which will permit excellent pedestrian and cycle accessibility to the external road system together with acceptable levels of natural surveillance of the highway area.
- The creation of a framework for the subdivision of appropriate and variably sized residential lots which will be orientated to ensure maximisation of the opportunities created by the significant visual landscape backdrops which the subject area enjoys and recognising the needs of public safety through maximisation of natural surveillance of the streetscape and public and private spaces.
- Appropriately sited areas of public open space which are exceptionally well located in relation to the major abutting areas of regional parkland to ensure that all dwellings are within 100 metres (2 minutes walking distance) of accessible open space.
- The public open space system is based on the principle of a core area of selectively located playspace, which amounts to 4% of the subject area, with the balance being provided at the periphery of the development area. This latter area will be landscaped and fully integrated with the landscaping which the developer proposes to undertake over part of the adjoining regional parklands. In total the two POS areas are well in excess of the minimum standard area required, being some 10.8% of the development area. The playspace or ‘pocket park’ will also be appropriately landscaped.
- An integrated and fully landscaped drainage system is to be located within the large areas of regional parkland, immediately adjacent to the subdivision, which will ensure that runoff from the development is stripped of nutrients and attenuated to standards acceptable to the authorities. These basins will be ‘off stream’ from existing creek lines and are to be state of the art ‘living stream’ design.
- The appropriate landscaping of land within the Mills Road reserve which abuts the project and which is set aside for future regional road requirements.
- Recognition of the proposed commercial development on the site which is located on the eastern side of Ferres Drive and specifically the proposed corner store which is to form a part of the proposed service station development together with the access needs of that site. With the exception of one lot, all lots within the ODP area are within 400m of the proposed corner store site, which will provide convenience retail needs for all residents.
- Provision of an integrated dual use path system (DUP) which will link all parts of the project with the external road system and the adjoining regional park system. The DUP system will be designed in such a way that it creates a circular pattern which will enable residents and visitors to walk, jog or cycle around the project, enjoying the nearby vistas, in the knowledge that their safety is enhanced through natural surveillance from adjoining dwellings and the road system.
- Provision of a fully reticulated sewerage system throughout.

Plan 14: West Martin Precinct 1 Outline Development Plan

### 4.3 Site Contextual Analysis

A visual site contextual analysis was conducted which confirmed the significance of the surrounding landscape elements and mid-distance views as being the major contextual design issues.

In the analysis the adjoining regional road system and its impact on the ODP, the future form of the system emerged as the most significant design constraint and as a result of consultation with Main Roads WA (MRWA), it emerged that the MRWA is only prepared to sanction one point of access into the project. Furthermore, having regard to the current design concepts in respect of the proposed adjoining commercial area, MRWA design criteria has dictated a specific location for that sole access into the project.

### 4.4 Design Interface

Interface issues presented by the subject area are complex owing to the nature of the surrounding parkland, the shape of the urban area which comprises the subject land and the sole point of access which is available with Ferres Drive.

The interface issues present a very positive aspect and immeasurable benefit to the development of the subject area however and afford the opportunity to create a design which will have its parkland backdrop wrapped around the majority of dwellings with in the project. Seventy one of the residential sites proposed (representing 66% of the total) enjoy views over the various proposed landscaped spaces.

The regional parkland which wraps around much of the subject area presents an unparalleled opportunity to create a unique residential living environment which will exist in close proximity to the metropolitan primary regional road system (with travel times of only approximately 25 minutes to the CBD), close proximity to a major centre, while being sited in a position which is in harmony with an exceptional surrounding rural landscape.

### 4.5 Outline Development Plan Concept

#### 4.5.1 Residential Component and Lot Design

In conformity with WAPC policy and the City of Gosnells Housing Strategy, a range of lot sizes and dwelling types are proposed to afford choice to homebuyers.

Market analysis indicates a clear preference for lots with areas of approximately 600m<sup>2</sup> in the area, which conforms with the standards applicable to the Residential R17.5 Coding currently applicable under the Council's Town Planning Scheme, although as already noted an Amendment has been initiated to provide more flexibility in future Coding both in the size and distribution of lots within the ODP area.

One of the primary considerations in the design and layout of lots has been the need to maximise both view potentials and rectangular lot configuration (wherever possible in an awkwardly shaped site) while maintaining minimum 18 metre frontages in general, unless lots are facing open space areas. A very high proportion of all lots (some 66%) will enjoy views either over the integral or surrounding open space areas, while 17% of the lots will also enjoy views to the Darling escarpment.

Owing to the critical need to create a safe environment, which dictates a peripheral road system, and the odd shape of the overall development area, it has regrettably generally not been possible to comply with solar orientation criteria.

The plan provides for a total of 104 single residential allotments, with a wide range of lot sizes ranging from 390m<sup>2</sup> to 785m<sup>2</sup>. Of these 88 lots comply with the R20 Code and 16 will have R25 Coding. Most lots will have minimum frontages of 18m. All of the smaller lots will overlook open space areas and these will have minimum frontages of 14m or 15m.

One R30 and two R40 medium density grouped housing sites are also proposed, which could provide for up to a further 36 dwellings, depending on detailed unit design considerations.

The two R40 Group Housing sites together with the R25 lots which are to be developed along the southern boundary all abut public spaces and it is therefore proposed that the development of these lots will be subject to a subdivisional requirement for preparation and approval by the City of Detailed Area Plans (DAPs), to ensure that development of the lots complies with the requirements of the Safe City Policy and the design criteria of Liveable Neighbourhoods and that all POS interface issues will be satisfactorily addressed. These DAPs will be prepared during the subdivision process.

#### 4.5.2 Public Open Space

Standard policy requirements are for 10% of the development area to be set aside as public open space (POS). Because the project area is surrounded by open space, consideration was given as to how the required POS could best be located, to serve and benefit both the needs of residents within the project and the community at large.

After examining a number of design options, it was determined that a relatively small and centrally located placed pocket park or playspace, together with enlargement and enhancement of the peripheral open space areas was the most appropriate design option and this has been adopted in the ODP.

The outcome proposed in the ODP will result in a total area which represents 10.8% of the development area, with approximately 0.42ha or 4% of the development area being set aside as the dedicated, landscaped playspace/pocket park area.

The following Table 4 shows the provision of public open space which is proposed within the ODP Area and the calculations involved in demonstrating the 10.8% figure.

**Table 4: Public Open Space Provision within ODP**

Gross Subdivisible Area of ODP	10.480 ha
POS Required at 10%	1.048 ha
POS to be Provided	
Landscaped Local Pocket Park/Safe Playspace	0.419 ha
Peripheral Accessible Landscaped Area	0.713 ha
<b>Total POS to be Provided</b>	<b>1.132 ha (10.8%)</b>

As stated in various sections of this report, in the course of more detailed planning, environmental and engineering design, all relevant issues will be subjected to progressively more detailed scrutiny and assessment by government agencies and the City as appropriate.

In addition to the usual subdivisional and utility services design approvals process, the proponent will be preparing a Landscaping and Irrigation Plan, in consultation with WAPC (as owner of the abutting Parks and Recreation Reserve lands), the DoE and the Council, together with a Maintenance and Monitoring Manual, in accordance with the requirements of the City of Gosnells Development of POS Policy 6.3.2.2.

### 4.5.3 Internal Movement Systems

As noted already two factors dominate the design of the internal trafficable road system, namely:-

- The overriding need for community safety issues to be addressed primarily through a road system which is peripheral to the regional and other open space areas to maximise natural surveillance over the open space areas and streets generally, and
- The outcome of negotiations with MRWA revealing that there is a singular point of entry into the subject area which meets the design criteria of and is acceptable to that authority.

Upon examination of the plan in detail it will be noted that in addressing these issues, little scope is left for much variation of design of the internal road system, although a number of variations have been examined prior to settling on the preferred option.

In the course of a site meeting with senior Council officers, when considerable discussion also took place in regard to the issues of current and likely future level variation between the subject area and the proposed adjoining highway works, it was agreed that the optimal design solution for the lots abutting Ferres Drive and the Mills Road West intersection, was in part for short lengths of estate wall and in part a service road, as depicted on Plan 14.

The road pattern and general subdivisional layout now proposed in the ODP is considered to represent the optimal design outcome having regard to all the varying design criteria which have been taken into consideration, over an eight month iterative design process.

Owing to the relatively small overall size of the proposed development, a traffic study has not been considered necessary, although the Council has indicated they will require a Traffic Safety Audit to be undertaken as part of the subdivisional process.

Applying 'rule of thumb' calculations, with dwellings generating an average of 8 vehicle trips per day (vpd), it can be expected that traffic volumes at the entrance to the project will be in the order of 1,100vpd. Traffic volumes internally will be commensurately low.

All internal streets will comprise an integrated system and will have a high degree of connectivity and legibility. They will have 15 metre road reserves where not abutting open space areas and will form a safe and convenient environment for both pedestrians and cyclists. Roads abutting open space areas will have 13.5m reserve widths, with offset carriageways, in accordance with standard City of Gosnells policy requirements. A 22m wide entry road reserve is planned to allow for enhanced landscaping in that location.

Owing to the high level of recreational cycle and pedestrian activity which can be expected in this attractive rural setting, an extensive dual use path (DUP) system is proposed. This DUP system will be circular to encourage use as an exercise track.

It is anticipated that the Council will give consideration to the future provision of a DUP system within the regional parkland and along the river floodplain as the parkland planning is extended into this area and that this will be incorporated within the Management Plan which the proponent will prepared for that area at the subdivisional stage.

### 4.5.4 Drainage

Following discussion with the Council, Water Corporation and Department of Environment it is proposed that all road drainage from the project will be treated in state of the art "living stream" swales which will be developed within the regional parklands abutting the site. Preliminary discussion with the WAPC as custodian of the land has indicated that they are amenable to the proposal in principle.

In addition to taking storm runoff from the project, the living stream system will also accommodate the runoff which emanates from the existing Ferres Drive, and land to the east. The creek system which abuts the northern boundary of the ODP collects run-off from land to the north of Mills Road and this presently flows directly into the Canning River without any nutrient stripping or other attenuation.

It is therefore intended that the living stream system which will be developed by the proponent, together with the Precinct 2 proponent, will greatly enhance the quality of run-off into the Canning River, as a result of the sedimentation and nutrient stripping which will occur within the streams and shallow swales.

The detailed design of the living stream drainage system will be incorporated into the parklands/river system Management Plan which the proponent will prepare at the subdivision stage.

## 5.0 ENGINEERING ISSUES

### 5.1 Background - Site Description

The majority of the area covered by the ODP is generally at approximately RL15 to 16m AHD and is further described in Section 3 of this report, under physical environment.

A geotechnical investigation was carried out in May 1993 by Coffey Geosciences and their findings generally concluded that the proposed development is situated on the Guildford Formation with a subsurface predominately sand with underlying clay sand. Further information is contained in the recent work carried out by RPSBBG and is also detailed in Section 3 of this Justification Report.

### 5.2 Siteworks

Siteworks will generally comprise the importation of sand fill material to provide a suitable clearance above predicted AAMGL levels (refer Section 3). In some areas general recontouring of the site will be undertaken to achieve desired fill levels. Finished levels will be determined to ensure adequate grades for drainage and sewerage and to provide acceptable slopes for building in accordance with marketing and maximum allowable engineering grades.

The surrounding road levels of Ferres Drive and Mills Road West will be incorporated when determining the finished levels of the site. Finished levels will also account for the localised groundwater perching as indicated in the investigation carried out by RPSBBG and as documented elsewhere in this report.

The lots to be developed within the site will be earthworked and fill be imported to achieve a Class S site classification as determined by AS2870.1.

A portion of the existing gully formation in the south-eastern part of the site will be filled and a retaining wall will be constructed along the boundary of the lots abutting the regional open space. The lot levels in this vicinity will be controlled by existing levels in Ferres Drive but will be kept as low as possible, consistent with acceptable road grades, adjoining lot levels and servicing constraints, to minimise the extent of walling at this interface.

Subject to detailed design and wherever possible, some areas of existing vegetation may be retained.

### 5.3 Access

As previously noted the ODP area is bounded to the north and east by Mills Road West and Ferres Drive respectively and these roads are defined as "red roads" and are under the control of MRWA. Preliminary discussions have been held with senior MRWA officers and they have advised that current planning indicates that these roads may in the long term be upgraded to dual carriageway status and Ferres Drive will become an important link in the regional road system, with the present T-Intersection of the two roads becoming reversed such that Mills Road West and Ferres Drive become a continuous road.

Given the current status of the abutting roads vehicle access into the ODP area is highly constrained. Following detailed discussions with MRWA and the City of Gosnells a sole access point into the area from Ferres Drive has now been determined. No access will be possible from Mills Road West. Consultation has also been undertaken with the developer of the proposed Commercial development on the eastern side of Ferres Drive, to ensure proper coordination of access arrangements.

The following Plan 15 indicates the available point of access which conforms with MRWA design constraints.

#### 5.4 Internal Roads

The internal roads will be designed in accordance with current WAPC policies for innovative and varied approaches to street development. The detailed design of roads will be carried out to the standards of the City of Gosnells and will be undertaken in consultation with the Council. Proposed reserve widths are indicated on the ODP. Road reserve widths are reduced locally where they abut open space areas and where they form a service road abutting Mills Road West, the former being 13.5m and the latter 13m in accordance with long-standing WAPC policy.

Typically pavement widths within these reserves will be 6 metres with the type of pavement yet to be determined within the narrower reserves pavements will be offset in accordance with usual practise.

#### 5.5 Drainage

Details of the proposed drainage and stormwater control and treatment have been documented in Section 3 of this report. As noted in that Section the broad proposal is for discharge and treatment locations to the west and southern periphery of the site.

Within the road system, the surface drainage will be via a conventional system of roads, gullies or side entry pits and underground pipes draining to treatment locations through gross pollutant traps. The pipe system will be designed to cater for runoff from storms with a frequency of up to 1 in 5 years within the local environment. Flows from less frequent events up to 1 in 100 years will be provided for in overland floodways comprising the roadways and public open space located within the development.

In some localised areas of predicted post development groundwater, subsoil drainage may be installed if required. Subsoil drains will be constructed at or above the pre-development AAMGL levels in line with the environmental criteria for the project.

As already addressed, a drainage and nutrient management plan will be prepared, which will include the detailed design of the stormwater management systems to be undertaken.

#### 5.6 Sewerage

The Water Corporation has made provision for the sewerage of the ODP area in its planning for the Martin area. Current Water Corporation planning indicates that reticulation sewers from Precinct 1 will discharge to a pump station which will be located within the Precinct 2 area. It is proposed that a Type 40 pump station will be constructed in the southern corner of that Precinct and that it will pump effluent to an existing Water Corporation pump station (Gosnells Pump Station No.2) which is located west of Frances Street on Mills Road West.

It is understood that the major developer within Precinct 2 is likely to be proceeding with subdivision in much the same timescale as envisaged within the ODP area. It is anticipated that the adjoining developer will be required by the Water Corporation to enter into a Customer Constructed Works Agreement for the construction of the pump station within their project.

Plan 15: MRWA Concepts

## 5.7 Water Supply

The Water Corporation has made provision for a water supply to the Precinct 1 ODP area in its current planning for the Martin area. Discussion with the Water Corporation indicate that there is existing supply capacity albeit that this is limited. To augment this limited supply, a DN250 water main will be required to be constructed along Mills Road West to Station Street in the initial phase. Subject to future demand from surrounding areas and the development of the subject area, a further upgrade will be required along Station Street and Lewis Street, which will also comprise a DN250 water main. The Water Corporation has confirmed that these are reticulation size water mains and accordingly will be developer funded.

## 5.8 Power, Telephone and Gas Supply

All of these services are available in the area and are capable of being extended into the ODP area and will be included in the construction phase of the project in the usual manner. Confirmation in regard to the telephone and gas connections are however still awaited from Telstra and Alinta Gas respectively.

Underground reticulated electricity supply for the project will be sourced from the adjacent high voltage power lines adjacent to the land. Specific land requirements for switching and transformer padmounts will be determined during the detailed design phase.

## 5.9 Services Conclusion

All essential utility services are available in proximity to Lots 830 & 831 and are capable of being upgraded and extended to serve Precinct 1 if so required.

## **6.0 COST SHARING PROVISIONS**

It is anticipated that the overall West Martin Outline Development Plan which is being prepared by the City of Gosnells, will eventually include cost sharing provisions in regard to such matters as the equitable cost sharing of the extension and upgrading of utility services and the equitable funding of the provision of land for public open space use throughout most of the West Martin precincts.

Having regard to the fact that the areas contained within Precincts 1 and 2 are already zoned to permit urban/residential development and the fact that planning and engineering investigations are at such an advanced stage in respect of these two precincts, the extension and upgrading of all utility services required to serve these areas will be constructed by the two developers, in consultation with one another and with the servicing authorities, or by the servicing authorities themselves as the case may, in the usual manner and according to the policies and standards of the servicing authorities.

The planning of both Precincts 1 and 2 also provides for each development to be fully self-sufficient in regard to meeting the full required public open space provision, in accordance with standard WAPC policy.

While there may be some scope for Precinct 1 and 2 developers to seek some form of monetary redress in regard to the initial expenditure which they will incur in regard to the extension and upgrading of services which might in some circumstances benefit the development of subsequent precincts, it is thought unlikely at this time that any satisfactory mechanism will evolve which would enable the initial developers to recover any such expenditure. They are consequently prepared to undertake all required works which they require, in the usual manner.

As at this time it is considered a possibility that the proposed commercial development of Precinct 7 may eventuate in a similar timescale to Precincts 1 and 2 and the developers of Precincts 1 and 2 will be liaising with the Precinct 7 proponent to determine if there are costs which can be shared to mutual benefit.

No provisions for any such cost sharing are consequently included in this proposal.

## 7.0 CONCLUSION

This proposal is consistent with all current statutory planning and policy objectives which are applicable to the area and the form of development proposed.

The technical and design evaluations which have been undertaken by the consultant team in respect of the proposed ODP have thoroughly examined all issues which are relevant to the future subdivision and development of the site. The outcome of these various investigations fully confirm the suitability of the land for residential subdivision in accordance with the detail shown in this ODP Justification report

The adoption of this ODP will facilitate the future subdivision and development of the area.

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## GRAPHS

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## PLATES

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Plate 1: View Across Cleared Paddock in the North East Corner of the Property



Plate 2: Native Vegetation has been Cleared to the Edge of the Fenceline



Plate 3: Tributary on the Northern Property Boundary is Heavily Weed Infested with Little Native Understorey Remaining



Plate 4: Bamboo and Other Exotics Occur within the Bush Forever Reserve to the Canning River



Plate 5: The Canning River is Also Heavily Weed Infested with Little Native Understorey Remaining

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## APPENDIX 1

### Groundwater Level Monitoring Results and AAMGL Mapping

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## APPENDIX 2

### Laboratory Report - Groundwater Analysis

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## APPENDIX 3

### ASS Field Log Results and WAPC ASS Risk Mapping