DRAFT BRANCH CIRCUS DISTRICT STRUCTURE PLAN

Prepared by: City of Cockburn Strategic Planning

December 2012

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APPENDICIES

Version Status

Version	Date Adopted By Council
August 2011	11 August 2011
December 2012	13 December 2012

PART ONE - BACKGROUND

1. INTRODUCTION

1.1. Background

Branch Circus District Structure Plan (DSP) comprises an area of land bounded by the Beeliar Regional Park and Hammond Road. The Branch Circus DSP structure plan area has been earmarked for urban residential development. The area recently underwent a lifting of its 'Urban Deferred' zoning under the Metropolitan Region Scheme (MRS).

The Branch Circus DSP area is zoned 'Development' in the City of Cockburn Town Planning Scheme No. 3 (TPS3) and included in Development Area 13 (DA13). Under this TPS3 a structure plan is required before any development or subdivision can commence.

The City of Cockburn prepared a Draft Branch DSP in 2008 which made a number of assumptions in relation to possible changes to the alignment and classification of the two wetlands within the subject area. The Draft Branch Circus DSP was advertised in July/August 2008 and a number of submissions raised concerns in relation to the assumptions made on the changes to the wetland categories and alignments, including concerns from State Government departments.

Consequently RPS produced a wetland assessment report to help determine the alignment and extent of the two wetlands. These reports were sent to the Department of Environment and Conservation (DEC) in August 2009 for their consideration and the DEC made a determination on the wetlands in June 2010. A copy of their determination is located in **Appendix 1**.

In August 2010, Council resolved not to proceed with the original version of the Draft Branch Circus DSP and decided that an entirely new structure plan should be prepared based on the new wetland mapping. In August 2011 Council adopted the Branch Circus District Structure Plan. The Branch Circus DSP is based on the new wetland classification and mapping.

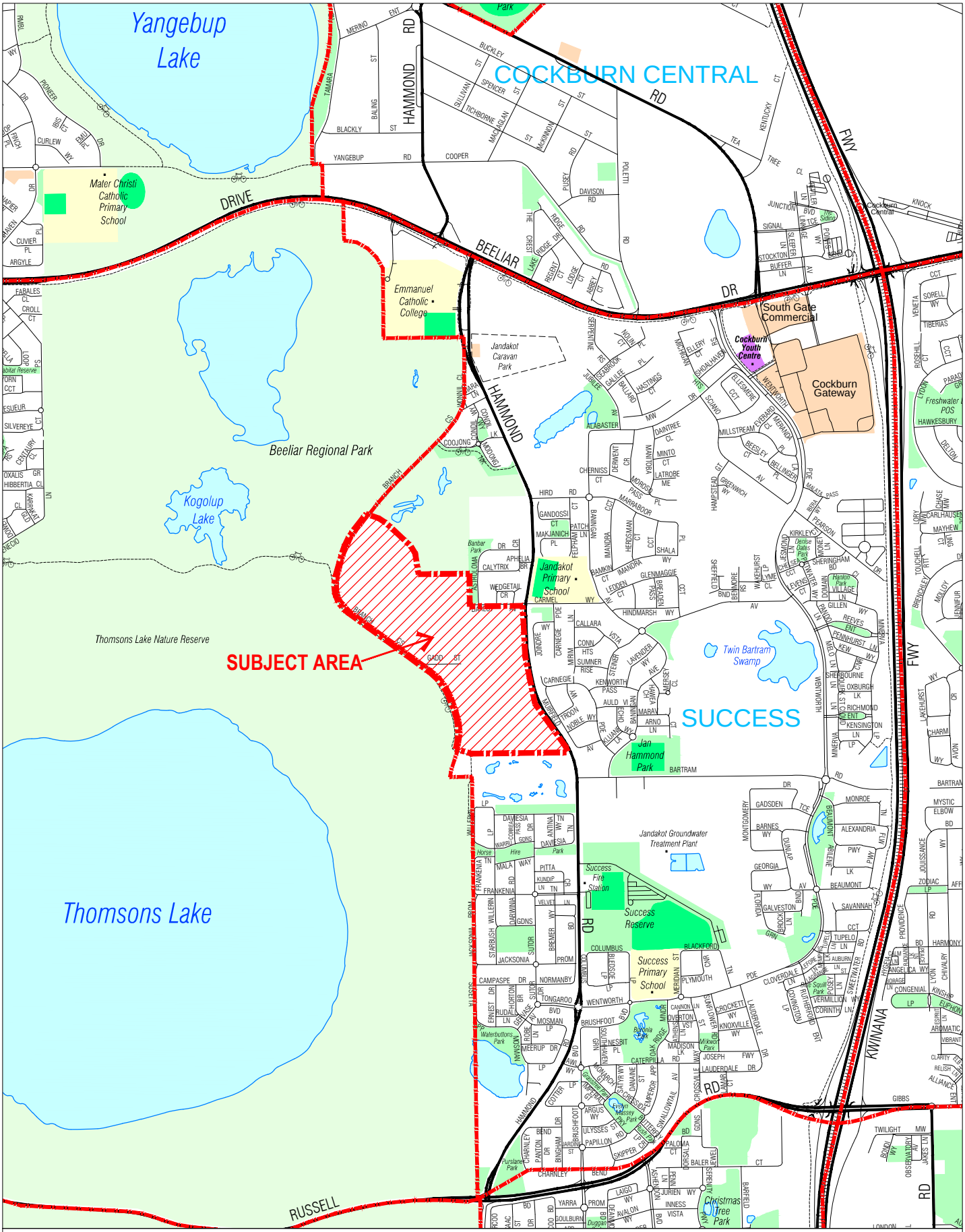
1.2. Purpose

The Branch Circus DSP shows the broad land use framework for the future development of the area including the road network, densities and open space areas. It will form the basis of coordinating and considering local structure plans (LSPs) and plans of subdivision to be prepared by landowners in the area.

The August 2011 version of the Branch Circus DSP was utilised to assist the Western Australian Planning Commission (WAPC) in lifting of the urban deferment under the Metropolitan Region Scheme (MRS). This was completed on 12 February 2012.

1.3. Planning Area

The Branch Circus DSP is bounded by Hammond Road to the east, Beeliar Regional Park to the west, and the Bartram Road Buffer lakes to the South. The extent of the area is shown on the **Figure 1- Site Location Plan**.



City of Cockburn
wetlands to waves

GNA 10/10

0 400m
SCALE 1:20,000

SITE LOCATION PLAN

BRANCH CIRCUS
DISTRICT STRUCTURE PLAN, SUCCESS

FIGURE 1

The structure plan area is approximately 1.8km south west of the Gateways Regional Centre, within the City of Cockburn. The land lies approximately 1.5 km south of Beeliar Drive along Hammond Road.

The urbanisation of the Branch Circus DSP area reflects a continuation of the existing urban front, with residential subdivision to the north, east and south of the DSP area.

1.4. Land Ownership

There are 13 individual lots within the Branch Circus DSP area, which have a total area of 35.56 ha. Lot sizes range between 1.6ha and 5.2ha. The Water Corporation also owns land running east-west through the site containing a water pipeline. Lot descriptions and ownership details are shown on **Figure 2 – Land Ownership Plan**.

Lots 2, 13, 12 and 22 Hammond Road, located in the south eastern corner of the Branch Circus DSP area, have been consolidated into one ownership group which represents the largest landowner in the DSP area.

1.5. Adoption of the Branch Circus District Structure Plan

It is proposed to adopt the Branch Circus DSP by resolution of Council as a "guiding document". It is not adopted pursuant to Part 6 of TPS3 and therefore does not implement zoning or apply land uses.

The Branch Circus DSP gives guidance to the assessment of local structure plans, which will be advertised, considered and determined pursuant to Part 6 of TPS3.

2. STATUTORY AND STRATEGIC PLANNING CONSIDERATIONS

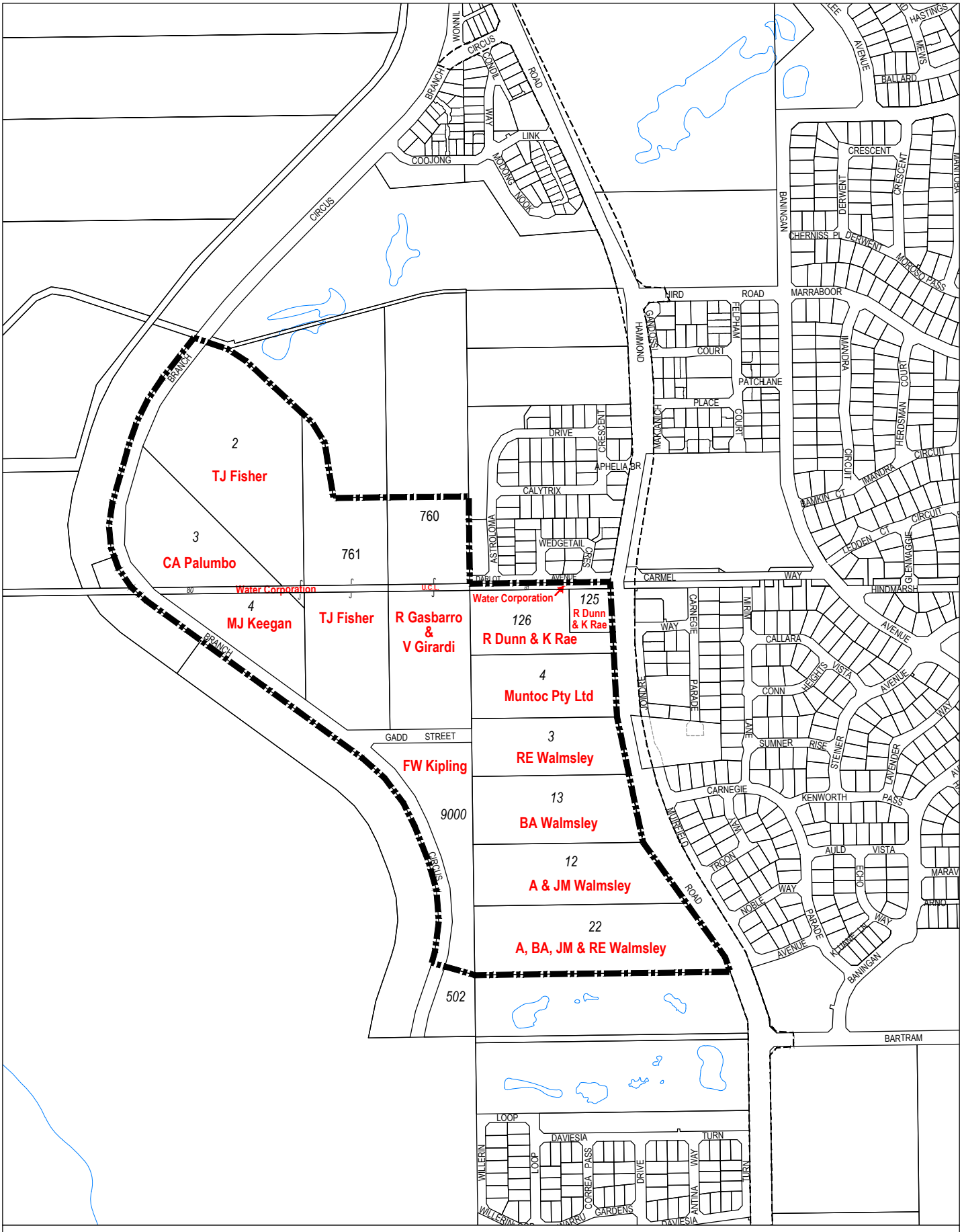
2.1. Metropolitan Region Scheme

The Branch Circus DSP area is presently zoned 'Urban Deferred' and 'Urban' under the MRS **(See Figure 3 – Metropolitan Region Scheme Zoning Plan).**Land to the west and north of Branch Circus is reserved as Parks and Recreation as part of the Beeliar Regional Park, which comprises a series of wetlands. All of the area to the east and south is zoned 'Urban' and is developed as a residential area with associated land uses. The August 2011 Branch Circus DSP formed the basis of an application to the WAPC to lift the urban deferment under the MRS. The WAPC lifted the Urban deferment on 12 February 2012.

2.2. City of Cockburn Town Planning Scheme No. 3

Under TPS3 the land is zoned 'Development' and included in Development Area 13 **(See Figure 4 – Town Planning Scheme No. 3 Zoning Plan).** The provisions of Development Area 13 state that the Development Area is identified for future residential development. Within this zone, subdivision and development is to be in accordance with a Structure Plan adopted pursuant to Section 6.2 of the TPS3.

The northern portion of Development Area 13 (lots 768, 778, 779 & 780 Hammond Road and Branch Circus, Success) have already undergone Structure Planning/subdivision approval and is already zoned 'Urban' under the MRS.



City of Cockburn
wetlands to waves

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SCALE 1:7,500

LAND OWNERSHIP PLAN

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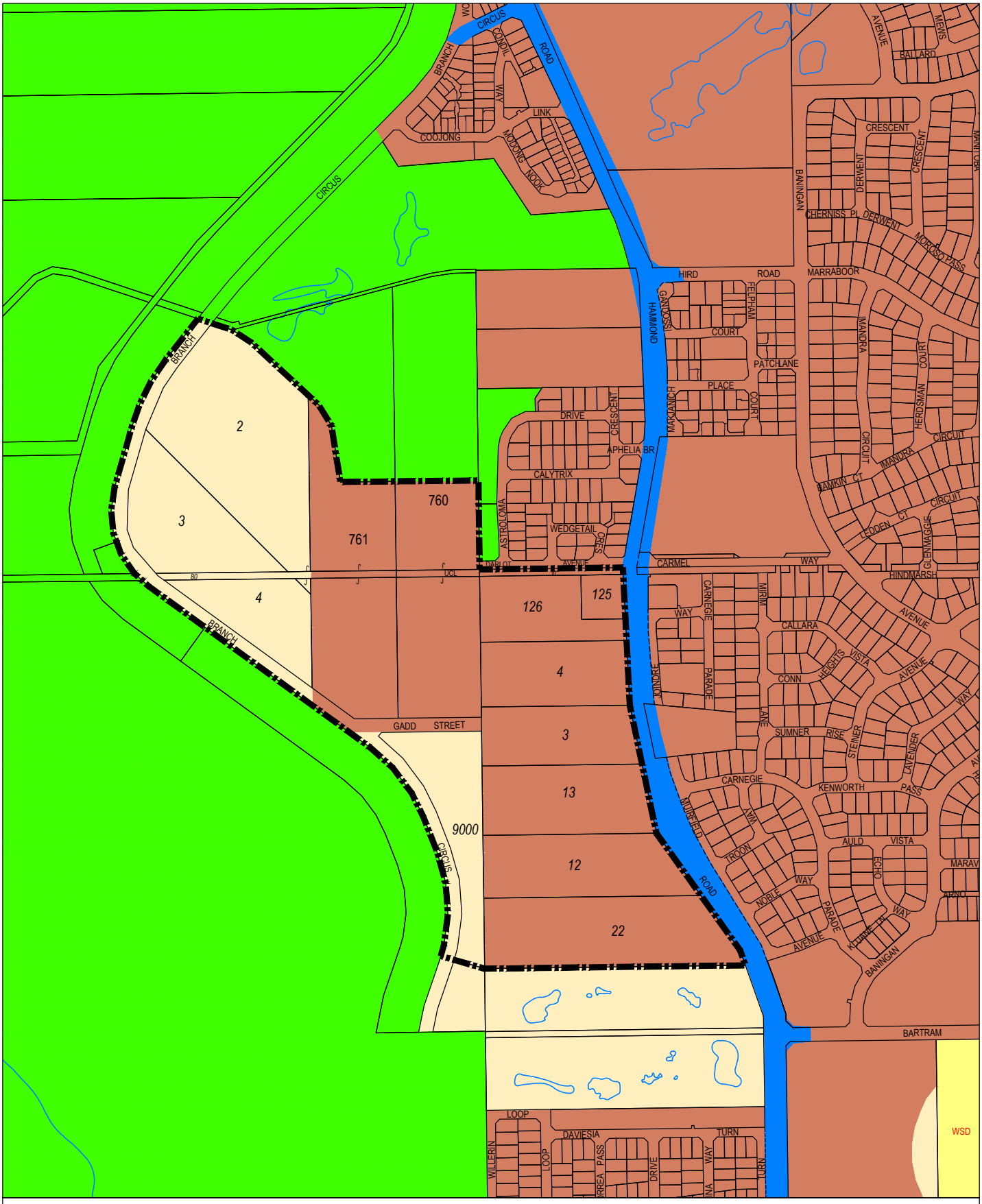
FIGURE 2



RESERVED LANDS

- Parks & Recreation
- Other Regional Roads
- Public Purposes

DENOTED AS FOLLOWS:
WSD Water Authority of WA

ZONES

- Urban
- Urban Deferred

GNA 9/12

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SCALE 1:7,500

METROPOLITAN REGION SCHEME ZONING PLAN

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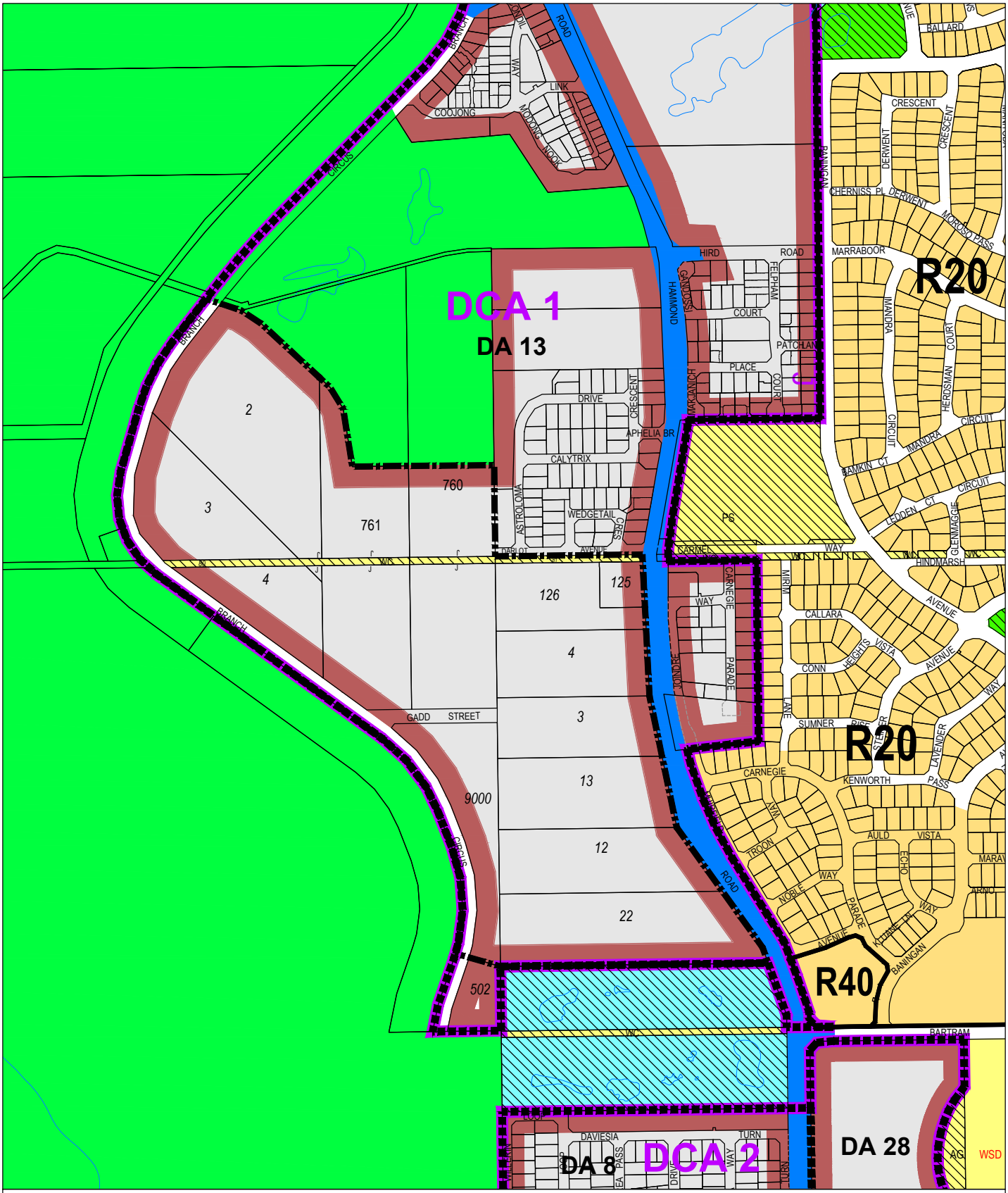
FIGURE 4



Structure Plan Boundary

GENERAL
R20 Residential Density Codes

SPECIAL CONTROL AREAS:
DA 1 Development Areas
DCA Development Contributuion Areas

REGION RESERVES
Parks & Recreation
Other Regional Roads
Public Purposes
DENOTED AS FOLLOWS:
WSD Water Authority of WA

LOCAL RESERVES
Parks & Recreation
Lakes & Drainage
Local Road
Public Purposes
DENOTED AS FOLLOWS:
AG Dept. of Agriculture
PS Primary School
WC Water Corporation

ZONES
Residential
Development

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0 150m
SCALE 1:7,500

TOWN PLANNING SCHEME No.3
ZONING PLAN
BRANCH CIRCUS
DISTRICT STRUCTURE PLAN, SUCCESS

FIGURE 4

2.3. Directions 2031 and beyond: Metropolitan planning beyond the horizon and the Draft Outer Metropolitan Perth and Peel Sub-Regional Strategy

Directions 2031 was adopted by the WAPC in August 2010 and is the latest spatial planning framework for Perth and Peel and outlines the planning vision and direction which will guide the planning of the City to 2031.

The Strategy recognises the benefits of a more consolidated city, which include;

- A reduced overall need for travel;
- Supports the use of public transport, cycling and walking for access to services, facilities and employment; and
- A more energy efficient urban form.

The Strategy aims to provide for different lifestyle choices, vibrant nodes for economic and social activity and a more sustainable urban transport network. A key component of the strategy is to increase the gross residential densities in greenfield areas and to provide for greater housing diversity, which are items specifically relevant to the Branch Circus DSP. *Directions 2031* seeks a 50 per cent increase in the current average residential density of 10 dwellings per gross urban zoned hectare in new development areas, i.e. 15 dwellings per gross urban zoned hectare of land.

The *Draft Outer Metropolitan Perth and Peel Sub-Regional Strategy* forms an integral part of *Directions 2031*. The Draft Strategy along with its counterpart for Central Metropolitan Perth provides the strategic spatial plan which will achieve the objectives of *Direction 2031*. The Draft Strategy identifies the subject area, along with a portion of land to the north of the Branch Circus DSP, as BRA1 and classifies it as 'urban zoned undeveloped', with the potential to deliver 600 plus dwellings in the future.

2.4. Liveable Neighbourhoods

Liveable Neighbourhoods is a WAPC operational policy for the design and assessment of structure plans and subdivisions for new urban areas. *Liveable Neighbourhoods* was prepared to implement the objectives of the *State Planning Strategy*, which aims to guide the sustainable development of Western Australia to 2029. The operational policy is an integrated planning code aimed at addressing both strategic and operational issues relating to the development of sustainable communities.

Liveable Neighbourhoods promotes the creation of walkable mixed-use neighbourhoods which reduce car dependency; facilitate safe, efficient and pleasant walking, cycling and driving environments; and fosters a sense of community and a strong local identity in neighbourhoods.

Liveable Neighbourhoods guides the design and development of greenfield developments through eight design elements; community design, movement networks, lot layout, public parkland, urban water management, utilities, activity centres and employment, and schools.

2.5. State of Planning Policy No. 3- Urban Growth and Settlement

This Policy sets out the principles and considerations to apply to planning for urban growth settlements in Western Australia. The Policy aims to facilitate sustainable patterns of urban growth and settlement. The Policy recognises that the State is undoing rapid growth and change which is expected to continue. The

policy acknowledges the that the spread of urban development intensifies pressures on valuable land and water resources, imposes costs for the provision of infrastructure and services, increases dependence on private cars and creates potential inequities for those living in the outer suburbs where job opportunities and services are not so readily available.

The objectives of the policy are:

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

2.6. State Planning Policy No. 4.2 – Activity Centres for Perth and Peel

State Planning Policy No. 4.2 – Activity Centres for Perth and Peel (SPP4.2) replaces the Metropolitan Centres Policy. The main purpose of SPP4.2 is to specify broad requirements for the planning and development of new activity centres and the redevelopment and renewal of existing centres in Perth and Peel. It is mainly concerned with the distribution, function, broad land use and urban design criteria of activity centres, and with coordinating their land use and infrastructure planning.

SPP4.2 identifies Cockburn as a Secondary Centre, but no District Centres within proximity to the subject area. SPP4.2 does not identify Neighborhood or Local Centers, rather these centres are designated through Local Structure Plans.

2.7. City of Cockburn Local Commercial Strategy (February 2002)

In February 2002 Shrapnel Urban Planning prepared a *Local Commercial Strategy* for the City of Cockburn consistent with the requirements of the Metropolitan Centres Policy. The *Local Commercial Strategy* has been used as the basis for decisions on retail centres for the last eight years.

In respect to the Branch Circus DSP area the Strategy identifies an existing Local Centre north of the DSP. This Local Centre currently only consists of a small delicatessen collocated with a caravan park. The Strategy identifies the Local Centre as having a future capacity of 1,200 shop retail floorspace. The location of this expanded Local Centre is likely to change and will be determined as part of future structure planning processes are in the area.

In response to the recent release of SPP 4.2, a review of the Local Commercial Strategy is currently underway. It is not anticipated there will be a great impact on the Branch Circus DSP area, other than perhaps recommendations to better align housing needs to suit local workforce opportunities. This can be dealt with at local structure planning stage.

2.8. Environmental Protection - Swan Coastal Lakes Policy 1992 and Wetlands Areas

The 1992 Swan Coastal Lakes Policy was prepared to protect the environmental values of lakes on the Swan Coastal Plain. The Policy made the filling, draining, excavating, polluting and clearing of these lakes an offence unless authorised by the Environmental Protection Authority (EPA).

Thomsons Lake, located to the west of the Branch Circus DSP area within the Beeliar Regional Park, is protected under the Policy and as such careful consideration needs to be given to the wetland to ensure that subdivision and drainage impacts on the Thomsons Lake are minimal.

2.9. Cockburn Sound Catchment Area

The Branch Circus DSP area is located within the Cockburn Sound Catchment Area which extends to the Kwinana Freeway and as far north as Beeliar Drive. The Cockburn Sound Management Council was established in August 2000 to facilitate coordination of environmental management and planning of Cockburn Sound and its catchment.

In 2005 the *State Environmental (Cockburn Sound) Policy 2005* was released by the EPS after extensive scientific and public consultation. The Policy authorises the Cockburn Sound Management Council to report annually on the 'State of the Sound' and have this report tabled in Parliament.

An Environmental Management Plan, prepared by the Cockburn Sound Management Council, outlines on-ground actions for implementing the Policy, and establishes the particular roles and responsibilities of managers and user groups.

In August 2003 the local authorities including the City of Cockburn signed a Memorandum of Understanding to ensure mutual and coordinated effort in the management and protection of the Cockburn Sound Catchment Area. This resulted in the preparation of a *Local Planning Policy (Cockburn Sound Catchment Policy)* which aims to ensure the protection of the marine waters of Cockburn Sound from nutrient contamination (particularly nitrogen) from diffuse land sources.

The Policy links the objectives of the Environmental Management Plan with State and Local Government to provide a consistent and unified approach to ensure planning and management decisions by Local Government within the catchment do not result in unsustainable additional nutrient loading or contamination of surface or groundwater resources.

2.10. Bush Forever

In December 2000 the WAPC published the 10 year strategic plan, Bush Forever. The plan protects regionally significant bushland of at least 10% of each of the original 26 vegetation complexes of the Swan Coastal Plain portion of the Perth metropolitan region. Bush Forever replaces the System 6 recommendations for the Swan Coastal Plain portion of the Perth metropolitan region. In June 2010

the WAPC released a *State Planning Policy 2.8 - Bushland Policy for the Perth Metropolitan Region* (SPP 2.8).

Beeliar Regional Park, which abuts the structure plan area, is nominated Bush Forever site 391. Beeliar Bush Forever site 391 is of high conservation importance and accordingly abutting development must be designed to ensure there are minimal impacts from future urban development.

2.11. Strategic Plan for Perth's Greenways

In December 1998 the Ministry for Planning released the final report on the Strategic Plan for Perth's Greenways. The report provides background information on the value of Greenways. At a strategic level the Greenway plan complements Bush Forever and is intended to act as a catalyst for the development of plans identifying strategic linkages between large conservation areas by providing corridors of vegetation to connect these sites.

The historic Baldivis tramway trail, which runs down the western boundary of the Branch Circus DSP is identified as Greenway link 78 in the Strategic Plan for Perth's Greenways. The tramway is reserved for 'Parks and Recreation' under the MRS and TPS3. The tramway continues south along the eastern boundary of the Thomson Lake Regional Reserve and then Hammond Road.

2.12. City of Cockburn Greening Plan

The City's Greening Plan, adopted in June 2001, is a long-term strategic plan for the maintenance and enhancement of remnant vegetation, the revegetation of previously cleared areas, road reserves, public land and the enhancement of ecological landscape, streetscape values and community amenity within the City of Cockburn.

The Greening Plan proposes the Baldivis tramway trail as a green link.

3. SITE CONTEXT AND ANALYSIS

3.1. Existing Land Use

In the past the Branch Circus area was zoned and used for rural purposes. **Figure 5** provides an aerial photo of the Branch Circus DSP area and **Figure 6** describes the existing uses, which include residences and outbuildings associated with rural activities. A decision on the future of any existing residences and outbuildings can be made at the time of preparing local structure plans and detailed plans of subdivision. Some of the rural properties are currently vacant**.**

3.2. Adjoining Land Uses

The urbanisation of the Branch Circus DSP area reflects a continuation of the existing urban front, with residential subdivision to the north, east and south of the DSP area. The Branch Circus DSP area is bounded to the west by the Beelier Regional Park containing the Thomsons Lake and EPP wetland.

As a consequence of the Branch Circus DSP being a greenfield development within the existing urban boundary of Perth, it is well located in relation to existing urban infrastructure and services. The urban context of the Branch Circus DSP area is shown in **Figure 7 – Contextual Analysis Plan**. As **Figure 7** demonstrates the Branch Circus DSP is connected to activity centres, employment

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Date of Aerial Photography: April 2011

Conservation Wetland

AERIAL PHOTOGRAPHY

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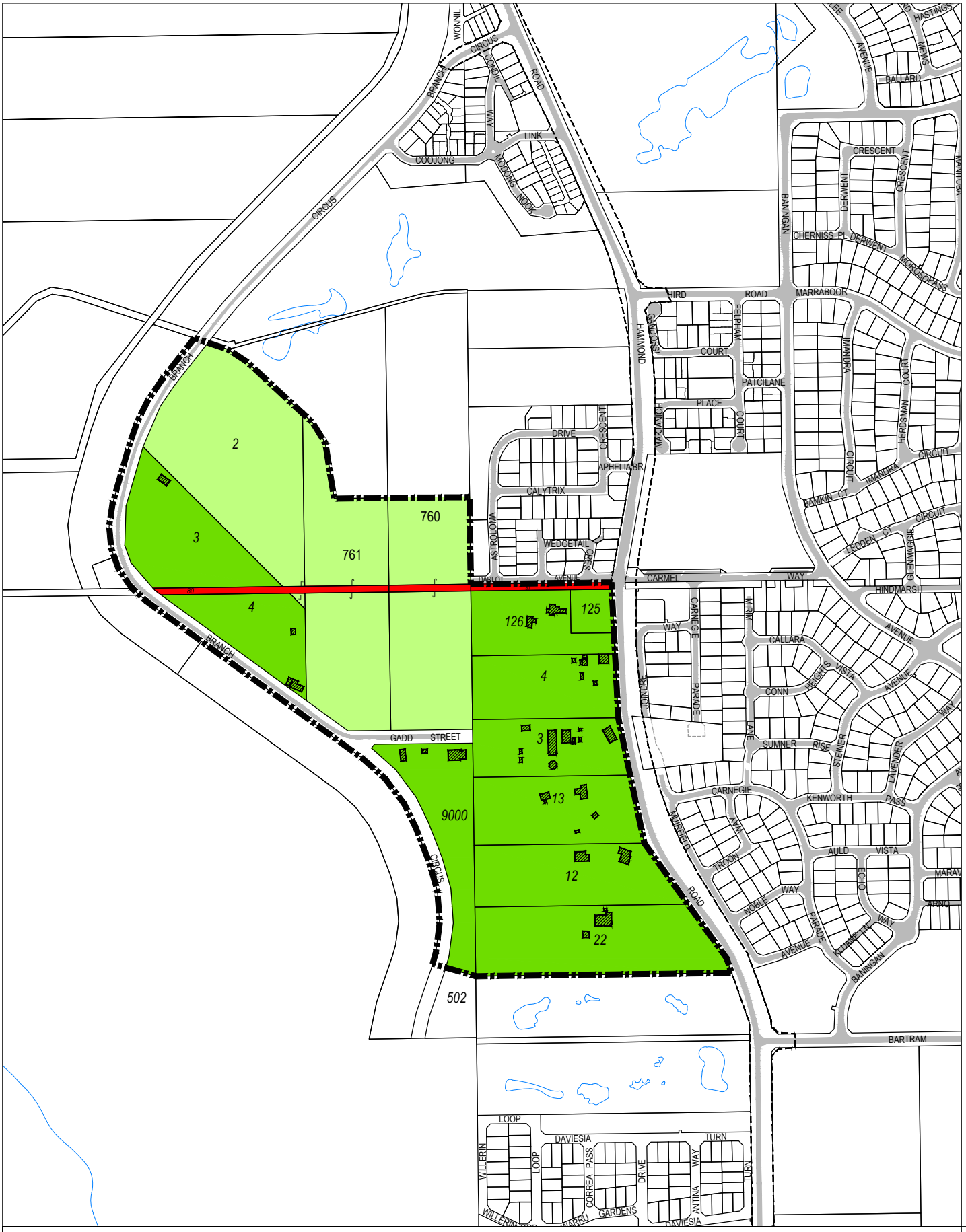
FIGURE 5



EXISTING LAND USE

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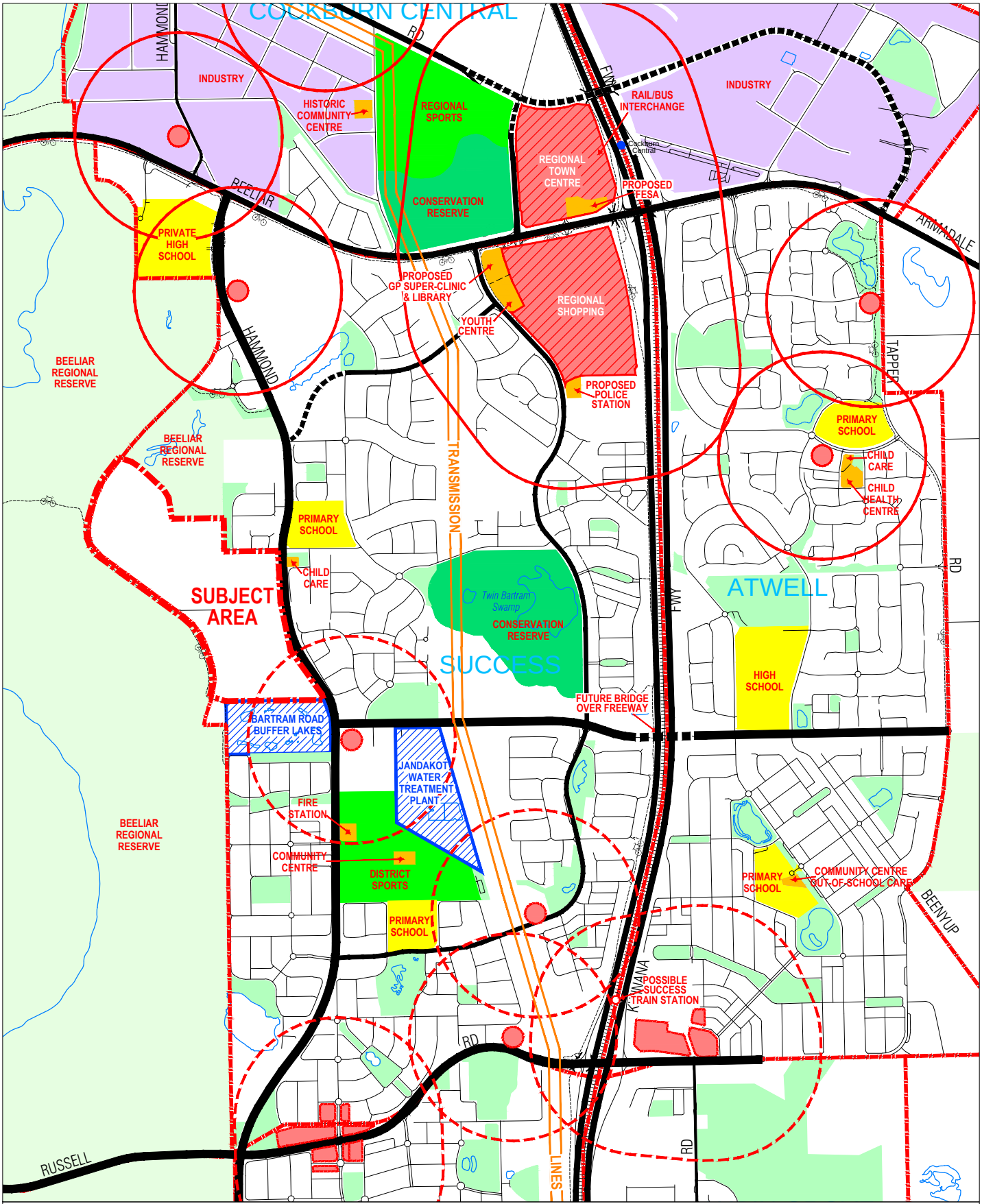
DISTRICT STRUCTURE PLAN, SUCCESS

FIGURE 6



City of Cockburn
wetlands to waves

CONTEXT ANALYSIS PLAN

BRANCH CIRCUS
DISTRICT STRUCTURE PLAN, SUCCESS

FIGURE 7

opportunities, education and recreational facilities via established transport infrastructure.

3.3. Topography, Soil and Landform

Elevation of the Branch Circus DSP area ranges from 18m AHD in the low lying northern wetland area to 33mAHD along the northern section of the eastern boundary. The south-western corner of the site is also low lying, with a contour level of 20mAHD.

Gozzard (1983) has mapped the geological units present at the site at regional scale. These include:

- Sandy Silt – Dark brownish grey silt with disseminated fine grained quarts sand with variable clay content. This soil type is located in areas identified as geomorphic wetlands. Gozzard has identified this unit as being unsuitable for urbanisation and road construction.
- Sand – Very light grey at surface to yellow at depth fine to medium grained Bassendean Sand. This soil type is considered suitable for both urbanisation and road construction.

Based on the City's general experience, it is possible that some of the lower lying areas or depressions throughout the Branch Circus DSP area could contain peaty or clayey materials. In these areas detailed geotechnical investigations will need to be undertaken prior to subdivision and or development and appropriate remediation works completed as part of the development works.

3.4. Flora and Vegetation

A level 2 Flora and Vegetation Survey was undertaken in August 2007 and October 2007 (Refer to **Appendix 2** for the RPS Flora and Vegetation Survey 2008). The survey found a total of 229 taxa of which 155 or 68% were native. The survey did not record any Declared Rare Flora protected under the *Wildlife Conservation Act 1950* and no species protected under the *Environmental Protection Biodiversity Conservation Act 1999* were recorded.

One Priority 2 and two Priority 4 species were recorded within the survey area.

There are three Vegetation Complexes defines within the structure plan area; *'Bassendean Dues: Central and South'* with the adjoining complex *'Spearwood Dunes: Karrakatta Central and South'* and the wetlands suite of *'Spearwood: Herdsman Complex'*.

The Karrakatta Complex Central and South has significant representation onsite as less than 30% of the remaining extent of this complex reserved for conservation in Bush Forever and less than 30% of the original extent of the complex remains in both the local and regional area.

A multivariate statistical analysis concluded that the five Vegetation Units defined for the survey area represent two Floristic Community Types (FCTs), 11 and 28. Both of these FCTs are well reserved and at low conservation risk.

No Threatened Ecological Communities were defined in the survey area.

Overall the vegetation within the survey area is in Completely Degraded condition with fragmented remnant bushland across the survey area ranging from Degraded to Excellent conditions.

The flora and vegetation in the Branch Circus DSP area does meet the criteria for regional conservation value, due to the presence of poorly reserved Vegetation Complex (Karrakatta Complex Central and South), the presence of 3 Priority Flora taxa along with a diversity of upland and lowland vegetation types.

The 2008 Flora and Vegetation Survey Report recommend that due to the fragmentation condition of remnant vegetation onsite, that conservation efforts are best directed to managing the impact of the proposed development in the context of it close proximity to regionally significant bushland in Bush Forever Site 391.

3.5. Wetlands

The Branch Circus DSP contains two wetland areas. The northern wetland is classified primarily as a Conservation Category Wetland (CCW) with a portion classified as a Multiple Use Wetland (MUW). The southern wetland is also predominantly classified as a CCW, with a portion of MUW (Refer to **Figure 8 – Opportunities and Constraints Plan**).

These wetlands were the subject of a wetland reclassification request, which was determined by the DEC in June 2010.

The outcome of the reclassification was that portions of the southern and northern wetland that were devoid or contained vegetation in a completely degraded condition were reclassified.

Portion of the northern wetland within Lots 2, 3 and 4 was reclassified from Resource Enhancement Wetland (REW) to CCW and the boundary of the wetland was altered. The portion of the REW on Lot 4 was reclassified to MUW.

Portion of the southern wetland on lots 3, 12 and 13 Hammond Road was reclassified from CCW to MUW.

The 2008 RPS Environmental Assessment Report (**See Appendix 3**) undertaken described the portion of the southern wetland which was reclassified as MUW as highly degraded and considerably altered through human associated clearing and weed invasion. The rehabilitation of this degraded wetland will need to be addressed at the local structure planning and subdivision stages of development.

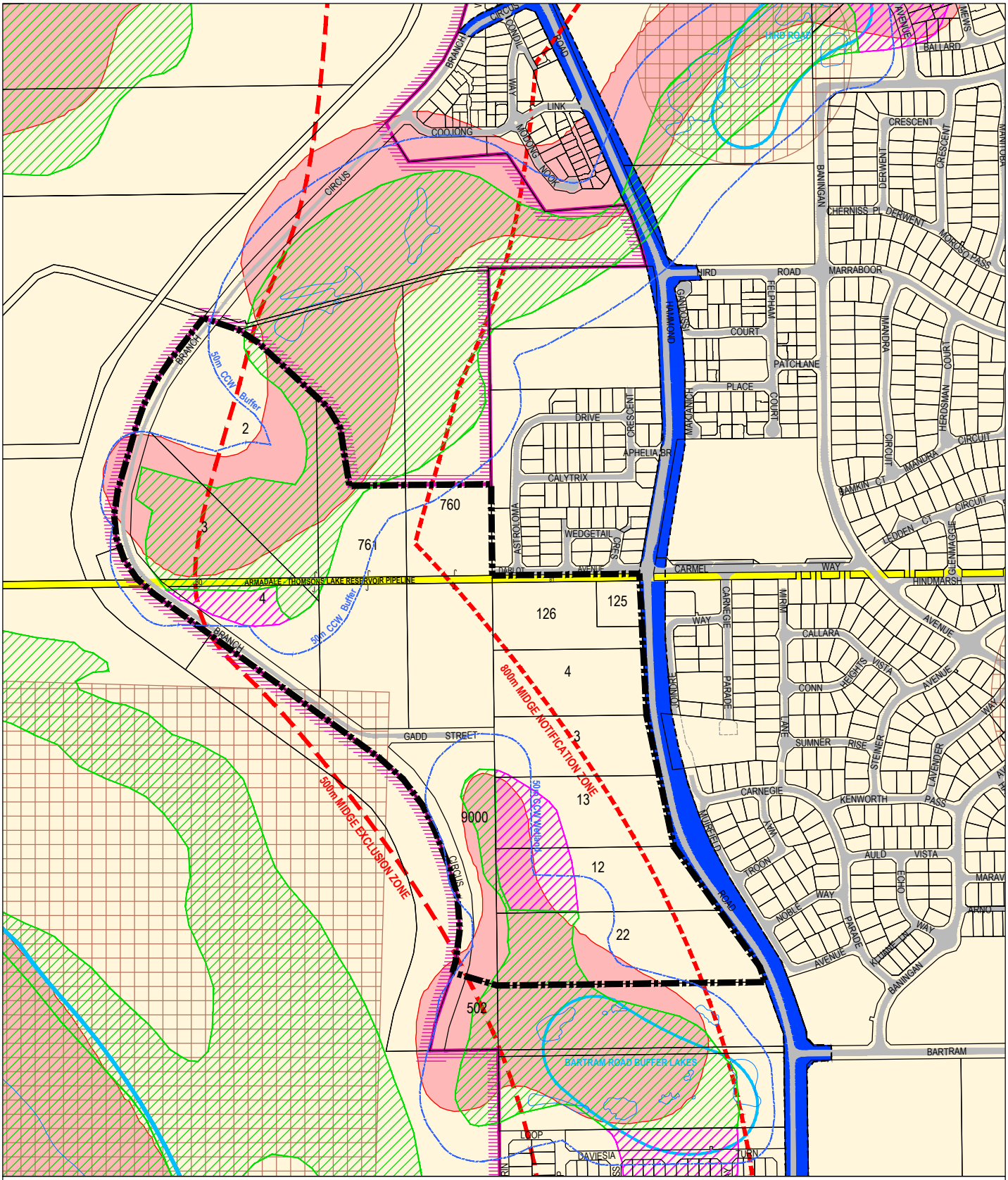
An EPP wetland called "Bartram Road Buffer Lakes" is located to the south of the Branch Circus DSP area. The EPP wetlands lie within the southern end of the CCW.

Generally no development is allowed within a 50m buffer of a CCW, as mapped in **Figure 8**.

The detailed design of the area between urban development and the CCW and MUW will need to be addressed at the local structure plan and detail subdivision stage in order to limit the negative impacts on the wetland. Environmental issues to be consider include maintaining ecosystem stability, filtering polluted/nutrient rich runoff, reducing outward spread of midges, reducing the spread of rubbish into the wetland and reducing outward disturbance of fauna by human activities.

3.6. Hydrology (Groundwater)

Groundwater flows in an east-north-east to west-south-west direction, towards Thomsons Lake. Groundwater contours across the Branch Circus DSP area range



* No known sites of Declared Rare Flora

* All Lots are within the Cockburn Sound Management Catchment Area

ACID SULPHATE SOILS

- High Risk
- Moderate to Low Risk

GEOMORPHIC WETLANDS
WETLAND CLASSIFICATION

- Conservation
- Resource Enhancement
- Multiple Use

- EPP Wetland
- 50m Conservation Category Wetland Buffer
- Bush Forever
- Aboriginal Sites

- 500m Midge Exclusion Zone Boundary
- 800m Midge Notification Zone Boundary
- Armadale - Thomsons Lake Reservoir Pipeline
- Other Reginal Roads (MRS)

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0 150m
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OPPORTUNITIES & CONSTRAINTS PLAN

BRANCH CIRCUS
DISTRICT STRUCTURE PLAN, SUCCESS

FIGURE 8

from approximately 17.5m AHD in the south-west to 20.5m AHD in the north-east corner of the site at the end of summer and 20.5m AHD in the south-west to 22.8mAHD in the north-east corner of the site at the end of winter (Refer **Figure 9 – Groundwater Levels**).

Given the reasonably regular topography within the structure plan area, with heights ranging from 19m AHD to 32m AHD, depth to groundwater therefore varies between approximately 0.5m-2.0m during summer to surface level during winter in the vicinity of the wetland.

The Branch Circus DSP area is located within the 'Category A' portion of the Jandakot Groundwater Environmental Management Area (EMA), according to the *EPA Guidance on the Assessment of Environmental Factors – Groundwater Management Areas.* Groundwater EMA's are defined as the groundwater catchments of environmentally significant wetlands, the hydrology of which is dominated by groundwater and not surface water sources.

3.7. Site Contamination and Uncontrolled Fill

The Environmental Assessment Report produced by RPS in 2008 (**See Appendix 3**) states there are no known nearby land uses that will conflict with potential urban development on the site. However the report does indicate that it is worthwhile considering the requirements for the management of development adjacent to the Thomsons Lake Nature Reserve, which is a part of the larger Beeliar Regional Park, managed by the DEC. This should include consideration of the interface management to prevent weed invasion and degradation, and allowance for pedestrian access into the park including signage.

Whilst there are no known contaminated sites in the area, there is the potential that land could be contaminated by harmful substances including pesticides as a result of past agricultural and horticultural activities. Accordingly, development and subdivision of those areas will be the subject of a Soil Contamination Assessment and if areas are identified it will be necessary for these to be remediated to recognised health standards determined by the DEC.

Likewise, it was not uncommon for low lying areas within the rural zone to be filled with both appropriate and inappropriate material and often over peat or clay areas. Accordingly, a geotechnical report will be required at the time of subdivision or development to confirm the suitability of these areas for residential purposes.

3.8. Sites of Indigenous Heritage Significance

The Branch Circus DSP area has one site listed on the Department of Indigenous Affairs' (DIA) Aboriginal Sites Register, affecting the south west corner of Lot 761. The details of the site are as follows:

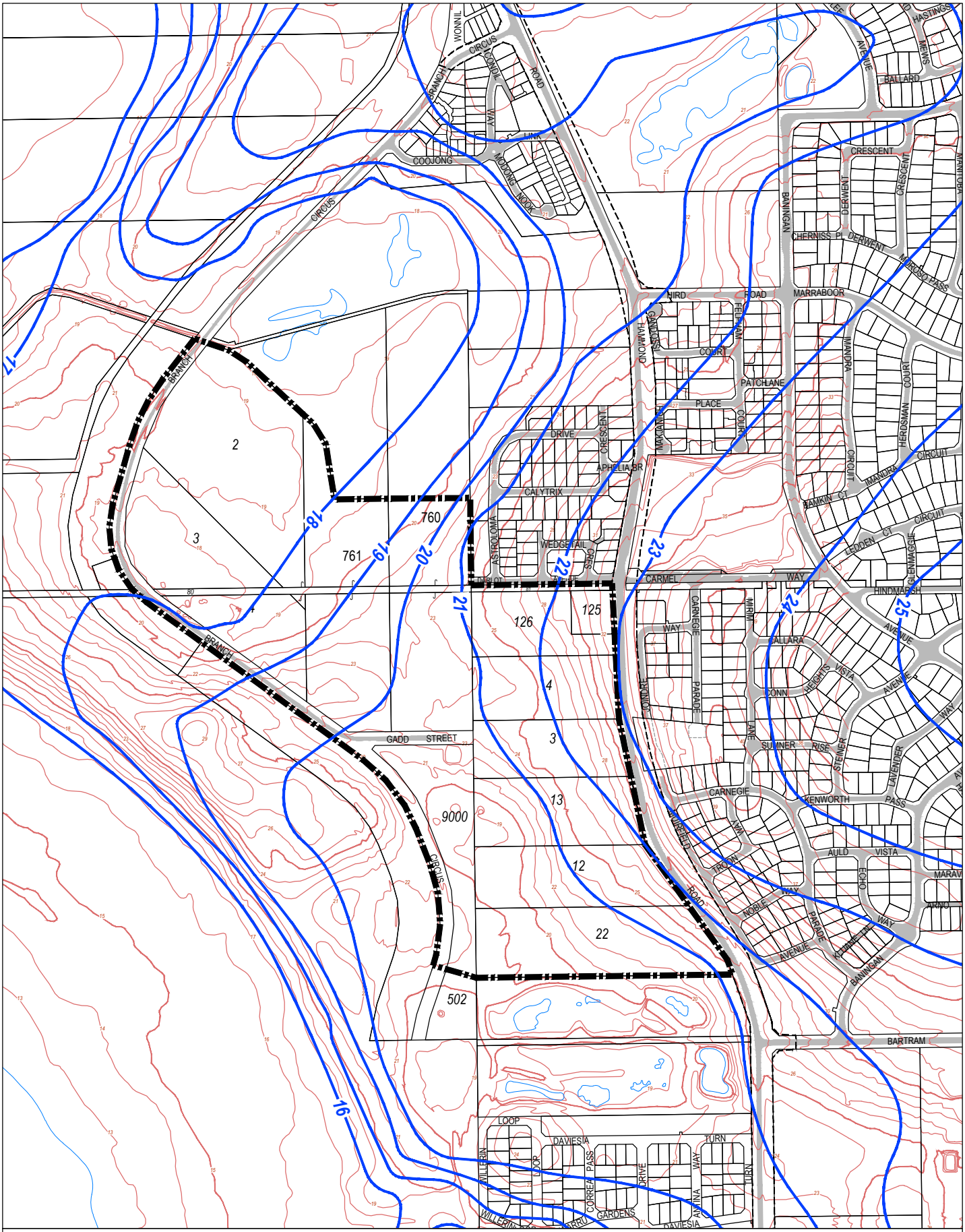
Site ID: 18938

Site Name: Thomsons Lake

Status: Interim Register

Access: Closed

Site Type: Ceremonial, Mythological, and Historical



Site 18938 covers the whole area of Thomsons Lake which is approximately 408ha. Only 0.68 ha of Site 18938 affects the study area on Lot 761.

Due to the high number of reported heritage sites within the surrounding area, it is possible that other sites existing within the Branch Circus DSP area that have not yet been listed on the Register System. The Aboriginal Heritage Act 1972 protects all Aboriginal sites in Western Australia, whether they are known to the DIA or not. An archaeological and ethnographic survey of the study area prior to any development may identify sites which have not yet been recorded. This issue should be addressed by individual proponents in consultation with DIA.

3.9. Sites of European Heritage Significance

The historic Baldivis tramway trail runs from Fremantle to Baldivis and was built to service the grouped settlement at Baldivis, following the second World War, acknowledging the need to ensure cheap access to employment and other services. The tramway runs down the western boundary of Branch Circus. The tramway is reserved for 'Parks and Recreation' under the MRS and TPS3. The tramway continues south along the eastern boundary of the Thomson Lake Regional Reserve and then Hammond Road.

The infrastructure associated with the tramway has long been removed, or overgrown. In some instances, evidence of tramway sleepers has been found. In recent times, the approach taken to the conservation and interpretation of this trail has been to respect its integrity and to not reduce or modify the existing reserve.

3.10. Implications for Urban Development

Implications for the subdivision and development of the area for residential and associated uses resulting from previous or existing land use activities are as follows:

- Geotechnical investigations will need to be undertaken on areas that have been subject to uncontrolled fill and the lower areas to substantiate suitable ground conditions.

- Completion of soil contamination surveys will need to be undertaken on land previously used for agricultural and horticultural purposes to ensure its suitability for residential purposes.

- An archaeological and ethnographic survey of the study area prior to any development may identify sites of Indigenous Heritage which have not yet been recorded. This issue should be addressed by individual proponents in consultation with DIA.

These requirements are normal within the City of Cockburn and do not affect the suitability of the area for urban development but rather represent matters that need to be addressed at the detailed planning and development phase.

4. DEVELOPMENT OPPORTUNITIES AND CONSTRAINTS

The previous sections have identified a number of opportunities and constraints that have an influence on the planning of the Branch Circus DSP area. These together with other factors are shown on the **Figure 8** and described in the following section.

4.1. Midge Buffers

The City's policy *Residential Rezoning and Subdivision Adjoining Midge Infested Lakes – (Policy APD6)* identifies a 500m 'Midge Exclusion Zone' surrounding Thomsons Lake. The Policy does not support the rezoning, subdivision or strata titiling of land for residential development within 500 metres of the edge of any lake or wetland in the district that is subject to potential midge infestation, unless it can be demonstrated to the satisfaction of the City that the lake or wetland does not have or can be prevented from midge infestation.

The Policy also requires that subdivider(s)/developer(s) of land between 500m and 800m of the lake or wetland edge are to impose a Notification, pursuant to Section 165 of the *Planning and Development Act 2005* on the title of each new residential lot advising prospective purchaser(s) that the land may be affected by midge infestation.

Figure 8, shows that the notional 500m 'Midge Exclusion Zone' affects a small part of the Branch Circus DSP area and an additional part of the DSP area is affected by 800 meter Notification Zone.

4.2. Bush Forever

Beeliar Regional Park, which abuts the Branch Circus DSP area, is nominated Bush Forever site 391. Beeliar Bush Forever site 391 is of high conservation importance and accordingly abutting development must be designed to ensure there are minimal impacts from future urban development.

A major issue to be dealt with at the local structure plan and detail subdivision stages will be the treatment of the interface between the Bush Forever site and the urban development.

4.3. Acid Sulfate Soils

Landgate's acid sulfate soils risk maps indicates the area of Sandy Silt, which corresponds to the wetland areas, represent a high risk of being Acid Sulfate Soils (ASS), with the remaining portion of the site, which compromises of sandy soils, represent a moderate to low risk of Actual Acid Sulphate Soils (AASS) and Potential Acid Sulfate Soils (PASS) occurring generally greater of 3 m.

Figure 8 shows that in the northern part of the Branch Circus DSP area, approximately half of Lot 2 and the majority of Lot 3 have a high risk for acid sulphate soils. In the south of the Branch Circus DSP area, a large portion of Lot 9000 and Lot 2 and the western part of Lots 12 and 13 are mapped as having a high risk for acid sulphate soils. The rest of the DSP area is at moderate to low risk of acid sulphate soils.

Proposals for subdivision and development in the areas of high and moderate to low risk will need to address this issue in detail as part of the local structure planning and subdivision processes.

4.4. Water Corporation Pipe Line

Figure 8 shows the location of the Armadale - Thomsons Lake Reservoir Pipeline that runs east west through the DSP area. A letter from the Water Corporation dated 14th June 2007 outlines their preferred treatment of this reserve:

"The Corporation's preference is that pipeline is not placed within the street frontage of lots with shared driveways and easements, as has previously been undertaken for some residential lots on Carmel Way and Hindmarsh Way to the east of the structure plan area.

The reserve should also not be fenced off or placed at the rear of lots as this would create both amenity and access problems.

The pipeline may be placed within local road reserves provided that the alignment of the pipe and its associated manholes, valves etc. are not placed under the road pavement surface. Alternately, portions of the pipeline could be located within public open space areas.

The Corporation would have no objection to allowing a limited number of north-south road crossing points over the water main. The land required for road crossings will need to be purchased from the Corporation at the developers' expense. The location of any road crossings should be carefully designed to avoid any existing valves, manholes or water sampling points along the main".

4.5. Fire Risk

A Fire Management Strategy (FMS) (FirePlan 2011) for the Branch Circus DSP has been prepared to reduce the threat to residents and fire fighters in the event of bush fire within or near the Branch Circus DSP area. A copy of the Branch Circus FMS is located in **Appendix 4**.

The Bush Fire Hazard Assessment for the site is Moderate-Extreme. The hazard rating for the adjoining Beeliar Regional Park is 'Extreme' and is classified as Banksia Woodland.

Management of the Bush Fire Risk within the Branch Circus DSP area will be a key consideration when preparing and assessing future LSPs and plans of subdivision within the DSP area.

The Branch Circus FMS is outlined in more detail in Section **6.11**.

5. WATER MANAGEMENT

Consistent with the requirements of the Department of Planning's *Better Urban Water Management* and the objectives of *State Planning Policy 2.9 - Water Resources,* a District Water Management Strategy (DWMS) has been prepared for the Branch Circus DSP area by Cardno (Refer to **Appendix 5** for a copy of the Branch Circus DWMS 2010). The DWMS has informed the preparation of the revised Branch Circus DSP and will form the basis for future LSPs and Local Water Management Strategies (LWMSs).

As per *Better Urban Water Management* the Branch Circus DWMS:

- Defines catchment objectives and design objectives for water quality, quantity and conservation for local planning and subdivision;
- Defines best water management practice;

- Determines the potential impact of proposed land use change on catchment hydrology;
- Provides detailed ecological, surface and groundwater investigations and modelling, focusing on potential risk, including acid sulphate soils;
- Provides detailed mapping of catchments;
- Identify appropriate sources for drinking water and other uses; and
- Defines ongoing management arrangements and responsibilities for urban water management.

The Branch Circus DWMS demonstrates that the Branch Circus DSP area is capable of supporting urban development and able to achieve appropriate urban water management outcomes.

5.1. Water Management Objectives

The DWMS and consequently the Branch Circus DSP is based on best practice integrated urban water management (IUWM) and water sensitive urban design (WSUD). The principles and objectives of best practice IUWM and WSUD that guided the DWMS are drawn from the following documents:

- *Stormwater Management Manual for Western Australia* (DoW 2007);
- *Liveable Neighbourhoods Edition 4* (WAPC 2007); and
- *Better Urban Water Management* (ESS 2008).

5.2. The Strategy

5.2.1. Water Source Allocation and Infrastructure

Using the Water Corporation's Water Use Model, the DWMS calculates that the total annual water consumption of the proposed Branch Circus development would be 155,200kL. The Water Corporation has confirmed that the existing infrastructure surrounding the development is sufficient to supply this fresh water and remove the resulting waste water.

Using the Water Use Model the water consumption of the development per person is 104kL/year, which is close to the maximum consumption target of 100kL/year per person set by the State Water Plan. Section **5.2.2** details strategies outlined in the DWMS identified to further reduce the development's potable scheme water requirements.

5.2.2. Water Conservation

Lot Potable Water Conservation

Significant reductions in water usage can be achieved through implementation of measures at a lot scale. These measures include In-house and Ex-house water saving devices and practices.

Such measures could be promoted or mandated by the developers within the Branch Circus DSP area as a part of the state Waterwise program; however, the ultimate responsibility for their implementation/uptake usually rests with individual lot owners.

Devices or practices where efficiencies can be made are:

- Shower heads;
- Toilets;
- Washing machines;
- Taps;
- Gardening practices;
- Rainwater tanks; and
- Recycled Greywater.

Due to the close proximity of the development to the CCWs, recycled grey water is not recommend as there is the risk of increased nutrient conveyance to the wetlands.

The DWMS calculates that a typical four person family house, not using water saving techniques will consume 595kL/year. This equates to approximately 150kL/year per person, which is greater than the State water consumption targets.

The DWMS showed that for a four person family home that does use all of the described water saving techniques, the total water consumption is 225kL/year (120kL in-house and 115kL ex-house). This equates to approximately 55kL/year per person.

The state water consumption target of between 40 to 60kL/year/person of scheme water could therefore be achieved through water saving devices and practices. To achieve this target will require educational programs and involvement of the lot owner, developer and the City of Cockburn.

The DWMS outlines the in-house and ex-house water saving measures which should be further investigated as part of the preparation of a LWMS at the local structure planning stage.

Development Potable Water Conservation

In the context of a drying local climate it is necessary that the use of water within the subdivision should be minimised wherever possible and can be achieved by application of the following approaches:

- Minimise water requirements for establishment of POS;
- Minimise water requirements for POS maintenance; and
- Minimise net use of water by maximising surface aquifer recharge.

The above criteria can be achieved through the various strategies presented below. These techniques should be further investigated as part of a LWMS.

Vegetation

Prior to clearing the development site, wherever possible, remnant native trees should be retained. As well as environmental benefits, the native vegetation will provide shade and reduce water requirements during POS establishment.

Native low-water requiring plants should be used in conjunction with soil conditioning and mulching to reduce water requirements and loss rates. Turfed areas require large quantities of water and thus these areas should be minimised.

Groundwater

The POS turfed areas of the development will require irrigation. It is recommended that where possible groundwater should be used as an alternative to scheme water. Based on the DSP, the DWMS estimates that the total POS area of approximately 4.96ha (excluding verge areas) would require 37,000kL of water a year. The DoW advices that combined extraction licences for up to 35,500kL/year exist across the study area. This could potentially be transferred to the Branch Circus DPS area.

Infiltration

Recharging of the underlying superficial aquifer through infiltration of stormwater, allows for more groundwater to be drawn during dry periods. Strategies to aid in increasing infiltration are: infiltration basins, aquifer recharge by injecting stormwater into the aquifer (not recommended for the study area), reducing paved areas, using porous pavement and soakwells.

Education

The managing authorities of the POS and basin areas should be educated on best management practices to ensure conservation of water; particular attention should be made to irrigation design and management to ensure POS areas are not over watered.

5.2.3. Surface Water Quantity Management Strategy

Developments typically have a high proportion of impervious surface area (roads/paths and roofs) when compared to the pre-development environment. The increased imperviousness results in:

- Increased total volume of runoff;
- Increased maximum runoff rate (peak discharge); and
- Decreased time for runoff to occur.

The basic principle of stormwater quantity management is to slow down the stormwater runoff and infiltrate as much as possible, mimicking the existing environment. This ensures lower peak discharges and lower volumes of runoff in main drainage corridors, which could lead to flooding.

Through consultation with the Water Corporation, the Department of Water and the City of Cockburn, and reviewing guiding documents, the following water quantity discharge objectives have been determined to guide surface water management under the DWMS and future LWMS:

- Retain the 1 year - 1 hour duration ARI rainfall event on site, preferably as close to source as possible;
- Detain the 10 year ARI rainfall event through to the 100 year ARI rainfall events so that the post-development peak discharge is attenuate to the pre-development peak discharge;

- The CCW must retain the 100 year ARI rainfall event in the post-development, as there is no discharge from this wetland for the existing environment; and
- A freeboard of 500mm between lot floor level and the flood water levels in the wetlands.

The above design criteria can be achieved through the use of various WSUD strategies. At a minimum, infiltration detention/retention basins are required to achieve the discharge requirements. The Branch Circus DWMS has achieved the requirements through the use of infiltration basins and proved the results through XPSWMM modelling.

Although the water quantity design criteria can be satisfied by the use of infiltration detention/retention basins, the size of these basins can be reduced and infiltration located closer to source by implementing various WSUD techniques. These techniques should be further investigated as part of the LWMS. Examples of possible WSUD techniques include:

- Lot Soakwells and Rainwater Tanks;
- Roadside Swales and Buffer Strips;
- Flush Kerbing;
- Bio-retention Swales;
- Porous Pavement and Non-porous Area Reduction;
- Junction Chamber Infiltration;
- Infiltration Detention Basins; and
- Retention Basins.

Flood Management

The southern CCW does not discharge via surface runoff (only slow discharge through infiltration and evapotranspiration) and hence a large rainfall event could produce a significant area of flooding. It is important to understand this flooding extent as it could affect the location and fill level of the future lots.

The DWMS used modelling to calculate the total volume of stormwater accumulating in the wetland for the pre-development and post-development environment. The total volume accumulating in the CCW is 20% greater in the post-development than in the pre-development.

The future structure planning and associated LWMS must ensure that this volume of flooding will not cause flooding of the lots. Specifically, that the floor level of the lots will have at least a 500mm freeboard.

Detail modelling using the LidAR topography data shows that there is no significant difference in the flood level or flood volume for the 100 year ARI event, for the comparison for the pre-development and post-development environment. This is due to most of the wetlands catchment remaining undeveloped, the provision of at-source infiltration within soakwells and vegetated retention basins, and the proposed development area not encroaching into the inundation area.

5.2.4. Stormwater Quality Management Strategy

Better Urban Water Management advocates a water quality management approach that establishes pre-development water quality standards and then sets targets for post development scenarios that reflect the pre-development water quality parameters. The stated principle is that existing surface and groundwater quality should be maintained as a minimum, and preferably improved prior to discharge from the development area.

Due to difficulties in measuring pollutants in surface and ground water and determining runoff trigger values, the surface water quality targets have been derived from the *National Water Quality Management Strategy*. The following water quality targets that should be met are percentage reductions that should be compared to a development that does not actively manage stormwater quality:

- 80% reduction of Total Suspended Solids (TSS);
- 60% reduction of Total Phosphorous (TP);
- 45% reduction of Total Nitrogen (TN); and
- 70% reduction in gross pollutants.

The key design criteria adopted by the DWMS to ensure that the above objectives are met includes:

- Retaining the 1 year - 1 hour duration ARI rainfall event on site; and
- Apply appropriate structural and non-structural measures to reduce applied nutrient loads.

Many of the surface water quantity WSUD techniques such as infiltration basin and swales also improve the quality of the surface water runoff. The following WSUD techniques should be investigated for their ability to improve the surface runoff water quality and presented in a future LWMS.

- Infiltration Retention Basins
- Bio-retention Swales
- Constructed Wetland
- Sedimentation Basins
- Gross Pollutant Traps
- Educational Programs

5.2.5. Ground Water Level Management Strategy

Developments have the potential to alter the groundwater levels though a combination of reduced infiltration capacity (more impermeable areas such as roads and houses) and altered extraction rates (bores used for irrigation and reduced uptake due to tree clearance). It is important that the pre-development groundwater levels are maintained as any alteration could impact on the environment; particularly for surface water body recharge and water available for vegetation.

The groundwater must be managed to prevent damage to the development and to the existing environment. Peak groundwater levels must be controlled or lots elevated sufficiently to prevent damage to the foundations. Groundwater levels

must also be maintained to provide water for Water Dependant Ecosystems. Therefore, the groundwater management criteria under the DWMS are to:

- Minimise changes to the underlying average groundwater level; and
- Ensure a separation distance between of 1.2m between the lot level and the AAMGL.

The above objectives can be achieved through the following methods:

- Sand Fill
- Sub-soil Drainage
- Encourage Infiltration

These techniques should be further investigated and presented in the LWMS.

5.2.6. Ground Water Quality Management Strategy

This DWMS aims to encourage infiltration where ever practicably possible. This infiltrated stormwater will enter the groundwater and may ultimately enter downstream water bodies such as Thomsons Lake and the two CCW. Thus, the groundwater quality objective is to maintain or improve the existing groundwater quality.

The groundwater quality should only be improved by reducing existing nutrient loads and not by actively 'treating' the groundwater. In order to maintain the existing groundwater quality, first accurate baseline data is required and post-development monitoring is required to assess the success of the implemented groundwater quality management techniques.

The areas where management strategies can be implemented to achieve the water quality objectives are:

Basins

It is proposed in this DWMS that the surface water runoff from the development will be directed to the three basins. The nutrient load from the development is concentrated at the basins and should therefore be intensively treated. As previously discussed, runoff will be retained in a vegetated portion of the detention basin. The selected vegetation species should be native, have a high nutrient requirement and can survive for a long period of time in dry conditions.

POS

The Branch Circus DSP is located in proximity to two CCWs. These wetlands require a buffer zone separating the development from the wetland. In this buffer zone, the use of natural vegetation is required. The use of turf in the POS, near the buffer zone, should be kept to a minimal. The natural vegetation will not require fertilisers however the turfed areas will require some input. Minimising the turfed area will reduce the nutrient load that could be transported to the wetlands via surface runoff and/or groundwater. The fertilizer requirements of the turfed area can be reduced by importing topsoil that has high phosphorus retention and using turf species that have low water and nutrient requirements.

Gardens

The Branch Circus DSP shows densities range from R20 to R40. Due to the medium density and anticipated large contemporary house design, there will only

be a small proportion of the lots available for gardens. From a groundwater quality perspective, this reduces the proportion of the lots that could leach nutrients into the groundwater. Thus, the lots in the development would be expected to leach fewer nutrients into the groundwater than compared to developments that have a larger proportion of the lot as garden areas. Nutrient leaching from the garden areas can further be reduced by the use of native vegetation species and suitable nutrient retaining soils.

Soakwells

Lots connected to soakwells convey high quality water from the roof area to the groundwater. Thus, the infiltrating water is of very high standard and will not increase the nutrient concentration in the groundwater.

Bottomless Junction Chamber

On a development scale, bottomless junction chambers (bottomless manholes) are similar to soakwells as they allow infiltration of runoff from roads at drainage pipe junction chambers. This is an effective method of reducing the total volume of runoff from the impervious road network. However, this infiltrated water is untreated and has the potential to transport some contaminants into soil and groundwater (although the soil profile will treat some of the contaminants). Careful consideration must be given to balance the benefits to stormwater quantity against the disadvantages to groundwater quality.

Educational Programs

The educational programs for the community can increase the success of water treatment strategies. The educational program should cover all aspects of water management including groundwater quality management.

5.3. Implementation of Strategy and Future Actions

At the local structure planning stage a LWMS must be prepared. The LWMS should present the water management strategies for the local structure plan area and an Urban Water Management Plan (UWMP) establishing how those strategies are to be implemented. These Strategies and Plans must address the recommendations of the DWMS. The additional work required to inform the preparation of a LWMS for the Branch Circus DSP area includes the following;

- Groundwater level monitoring;
- Determination of AAMGL and sand fill requirements;
- Groundwater quality monitoring;
- Determination of contamination or nutrient 'hotspots';
- Surface water quality monitoring;
- Determination of trigger values for post-development surface water and groundwater quality monitoring;
- Investigation of infiltration rates;
- Determination of suitable locations for infiltration techniques (soakwells, infiltration basins etc);
- Confirmation of stormwater management strategy consistent with the approach detailed in this DWMS;

- ASS investigation;
- Development of a management plan if ASS are found within the study area;
- Rare flora and fauna investigation; and☐☐Determine a management plan to protect rare flora or fauna found, whilst enabling the development to proceed.

PART TWO – DISTRICT STRUCTURE PLAN

6. DISTRICT STRUCTURE PLAN DESIGN

6.1. Development Principles

The key development principles of the Branch Circus DSP, as shown in **Figure 10**, are to:

1. Provide a framework for urban land uses within the DPS area that integrates with the Sub Regional context;
2. Respond to the social and economic needs of the community in a timely way;
3. Provide a framework for future local structure planning and subdivision, allowing for refinement of detail and recognition of previous uses;
4. Provide for a variety of housing choice through a range of densities;
5. Define a robust road network reflecting and accommodating public and private transport priorities, responding to the Sub Regional transport network;
6. An integrated open space, conservation and drainage network, balancing environmental, recreational and drainage objectives;
7. Provide for sustainable land use and lot design that responds to solar orientation principles as well as Crime Prevention through Environmental Design;

6.2. Transport and Access Network

The Branch Circus DSP proposes a highly connected street network which provides a coherent walkable urban structure. The proposed street network provides a system of local streets with good access to the external arterial routes of Hammond Road and Branch Circus. The permeable local street network supports walking and cycling through the area and allows people from residential areas to the east to access the Beeliar Regional Park.

A comprehensive traffic study is not required for the structure plan area as it relates to a small area which has a low development yield (approximately 300 dwellings) and will not accommodate through traffic. The street network consists of a series of Access Streets (local roads) which have a width of 15m and 13.5m for those which abut public open space (POS) whilst the existing Branch Circus and Gadd Streets have road reserves of 20m.

Uloth and Associates prepared a district traffic study for the City in 2006. According to this study, Hammond Road had approximately 5,800 vehicles per day near Beeliar Drive and approximately 2080 vehicles per day near Bartram Road in December 2004. By 2031 (without Roe Highway), the study forecasts approximately 10,300 to 11,280 vehicles per day will use Hammond Road. Beeliar Drive (near Hammond Road) is projected to carry approximately 29,160 vehicles per day.

Hammond Road will be classified as a District Distributor Road with no residences allowed direct frontage. This road classification also limits the number of intersections. The principal access point from Hammond Road to the site is via Darlot Avenue. Traffic lights will ultimately need to be constructed at this intersection.

LOTS 2,3,4 & 9000 BRANCH CIRCUS, SUCCESS:

LOTS 2,3,4 & 9000 BRANCH CIRCUS, SUCCESS HAVE BEEN IDENTIFIED AS CONSTRAINED. THESE LOTS ARE AFFECTED BY:

- CONSERVATION CATEGORY CATEGORY WETLANDS AND THEIR BUFFERS
- BUSHFIRE RISK
- INTERFACE ISSUES WITH THE BEELIAR REGIONAL RESERVE
- DISLOCATION FROM THE URBAN FRONT

THE CITY OF COCKBURN SUPPORTS THE RESERVING OF THESE PARCELS OF LAND FOR RESERVATION - PARKS AND RECREATION UNDER THE METROPOLITAN REGION SCHEME.

SHOULD RESERVATION OF THE LAND UNDER THE METROPOLITAN REGION SCHEME NOT BE SUCCESSFUL, THE LAND WOULD ALTERNATIVELY BE SUITABLE FOR INCLUSION WITHIN THE CONSERVATION ZONE UNDER THE CITY'S TOWN PLANNING SCHEME. THIS CAN BE BY WAY OF A FUTURE STRUCTURE PLAN.

BUILDING PROTECTION ZONE (LOW FUEL AREA):

LOCAL STRUCTURE PLANS TO BALANCE BUSH FIRE MANAGEMENT OBJECTIVES WITH WETLAND MANAGEMENT OBJECTIVES. REFINEMENT OF URBAN STRUCTURE MAY BE REQUIRED TO ACHIEVE BOTH BUSH FIRE AND WETLAND MANAGEMENT OBJECTIVES.

NOTE:

UNCONSTRUCTED ROAD RESERVE TO BE FORMALLY CLOSED AND AMALGAMATED WITH ADJOINING REGIONAL PARK.

ROADS ADJACENT TO PUBLIC OPEN SPACE:

ROAD RESERVES ADJACENT TO PUBLIC OPEN SPACE ARE TO ACCOMMODATE ALL BATTERING RELATED TO ROAD CONSTRUCTION. TO ACHIEVE THIS, LOCAL STRUCTURE PLANS MAY NEED TO PROVIDE A LARGER ROAD RESERVE THAN SHOWN ON THE DISTRICT STRUCTURE PLAN.

MOSQUITO MANAGEMENT:

LOCAL STRUCTURE PLANS TO ADDRESS THE RISK POSED TO FUTURE RESIDENTS BY MOSQUITOES AND MOSQUITO-BORNE DISEASES.

City of Cockburn
wetlands to waves

GNA 7/11

0 75m
SCALE

- Structure Plan Boundary
- Residential R25
- Residential R30
- Residential R40
- Special Use
- Public Open Space
- Regional Open Space
- Public Purposes
- Constrained Site
- Conservation Category Wetland
- 50m CCW Buffer
- Mutiple Use Category Wetland
- Building Protection Zone (30m)
- Pedestrian/Cycle Links
- Bush Forever Boundary
- EPP Wetland Boundary

DISTRICT STRUCTURE PLAN
BRANCH CIRCUS

LOTS 3,4,12,13,22,81,125,126 & UCL, HAMMOND ROAD, LOTS 2,3,4,80,761,9000 BRANCH CIRCUS, & LOT 760 GADD STREET, SUCCESS

All areas coded R30 and R40 have rear laneway access which allows lot frontages to be reduced whilst avoiding streetscapes dominated by garages hence providing more pleasant streetscapes. Visitor parking will need to be accommodated for laneway lots with the location of the bays to be determined at the local structure planning stage.

6.2.1. Shared paths/connections

There are existing dual use paths (DUP) along most of Branch Circus within the Beeliar Regional Reserve and along the existing section of Darlot Avenue and Astroloma Drive. A DUP is proposed along Hammond Road as part of the upgrade of this road which is covered under Developer Contribution Area 1. To provide a connective DUP system, the Branch Circus DSP proposes to extend the DUP along Darlot Avenue westwards, extend the DUP along Astroloma Drive southwards and provide a further east west linkage towards the southern end of the Branch Circus DSP area. Footpaths should be provided on one side of all the proposed streets.

6.3. Public Transport

No public transport routes are proposed within the Branch Circus DSP area. However existing bus routes exist along Hammond Road, north of Carmel Way, and south of Bartram Road which links to the Cockburn Central Town Centre and Gateways Shopping Centre.

The Branch Circus DSP movement network ensures good pedestrian and cycle access to bus routes.

The nearest railway station to the Branch Circus DSP area is Cockburn Central, north of Beeliar Drive. The Atwell (Aubin Grove) railway station proposed for north of the Russell Road freeway interchange is also planned with construction expected to commence in the near future..

6.4. Residential Development

6.4.1. Housing Principles

The housing principles for the Branch Circus DSP area which will guide future local structure planning and subdivision are:

1. Provide diversity in housing choice, lot sizes and tenure;
2. Strive to achieve, as far as practicable, the *Direction 2031* dwelling targets per gross urban zoned hectare of land;
3. Higher density located adjacent to public open space offering;
4. Housing design, lot layout and access arrangements that create attractive streetscapes;
5. Environmentally sustainable design approaches in terms of solar orientation of lots.

6.4.2. Residential Densities and Housing Types

The Branch Circus DSP prescribes residential density codings, consistent with the principles outlined above.

The DSP nominates a mixture of medium densities (R25, R30 and R40) across the residential areas. The DSP provides a balanced mix of densities to facilitates the delivery of a wider choice of housing types. Providing for a range of housing types through density allocation ensures future development will provide for the diverse and changing needs of our community.

The Branch Circus DSP prescribes higher medium densities adjacent to POS areas which will offer high amenity outlooks for future dwellings.

The Branch Circus DSP proposes an internal street network to support the prescribed medium densities. All areas coded R30 and R40 have rear laneway access which allows lot frontages to be reduced whilst avoiding streetscapes dominated by garages, hence providing more pleasant streetscapes.

In accordance with *Liveable Neighbourhoods* the Branch Circus DSP requires that Detailed Area Plans (DAPs) should be prepared for lots with an area less than 350m^2, lots abutting POS and lots with laneway access.

6.4.3. Lot Yield Estimates

The Branch Circus DSP is forecast to yield approximately 300 dwelling units across the DSP area. **Table 1** outlines how the 300 dwelling target is expected to be delivered within the R25, R30 and R40 coded residential areas.

Table 1 – Branch Circus DSP Estimated Lot yields

Density	Estimated Average lot Size	Total Area (site hectare)	Estimated Yield
R25	350 m^2	3.55ha	100
R30	300 m^2	2.2ha	68
R40	220 m^2	3.35ha	152
Total		**9.1ha**	**320**
Dwelling Units per site hectare			**35**

The Branch Circus DSP does not deliver the 600 plus dwelling forecast for the BRA1 'urban zoned undeveloped' area under *Direction 2031.* The 600 plus dwelling forecast also includes two 'Urban' zoned lots, with a total area of 4.07 ha, located to the north of the DSP area. The *Direction 2031* dwelling target was based on an expected development scenario held before the DEC's determination of the wetland reclassification in June 2010. The DEC's June 2010 determination to reclassify portion of the northern wetland from REW to CCW reduced the area available for urban development. In light of these two factors the Branch Circus DSP dwelling target of 300 dwellings is considered appropriate.

The Branch Circus DPS delivers an average residential density of 8 dwellings per gross urban zoned hectare (the area zoned 'Urban Deferred' under the MRS) and therefore does not meet the density target for greenfield developments set out in *Directions 2031.* The land identified as 'Not Suitable for Urban Development or Closer Settlement' and the CCW areas, which protect high value environmental areas, drastically reduce the achievable average dwelling density per gross urban zoned hectare across the DSP area.

However, using *Liveable Neighbourhoods* Urban Density calculations (includes POS and streets, excludes land identified as 'Not suitable for Urban Development or Closer Settlement', CCWs, and Public Purpose reserve) the average residential density increases to approximately 13.4 dwellings per hectare. Using density calculations based on site hectare, as demonstrated by **Table 1**, the Branch Circus DSP achieves an average density of 35 dwellings per hectare. These calculations are based on the average site areas under the *Residential Design Codes of Western Australia* (R-Codes). It is noted that these site areas, and the minimum site areas set out in the R-Codes, are not applicable to multiple dwellings in areas codes R30 or greater under the R-Codes as amended in November 2010. As there are many sites coded R30 and R40 under the Branch Circus DSP, that have the potential to be developed as multiple dwellings, the site hectare dwelling calculations are considered conservative density calculations.

6.4.4. Density targets for Local Structure Plans and Subdivision

Future LSPs and subdivision applications within the Branch Circus DSP area will be required to generally accord with the residential densities prescribed in the Branch Circus DSP.

LSPs must meet or exceed the residential densities prescribed in the DSP.

In the case of subdivision applications, where plans of subdivision show single residential lots, these lots must achieve an average site area not greater than 15% larger than the average site area prescribed under the R-Codes for the relevant density. i.e. an average site area of not greater than 402.5m^2 in areas coded R25, 345m^2 in areas coded R30, and 253m^2 in areas coded R40.

Variations to the densities prescribed under the DSP will be assessed against the housing principles set out in Section **6.4.1**, the above density requirements, and the locational criteria set out below

6.4.5. Locational Criteria - Residential R25 (base)

1. Residential R25 will be the base (lowest) coding prescribed over the Branch Circus DSP area.

6.4.6. Locational Criteria - Residential R35-40

1. Generally surrounding areas of high amenity, such as open space;

2. Located so as to maximise access to and use of services and facilities such as POS, schools, and public transport routes, and;

3. Located to enhance passive surveillance of public spaces.

6.4.7. Locational Criteria – Aged and Dependant Person's Dwellings

1. Generally surrounding areas of high amenity, such as open space;

2. Located so as to maximise access to and use of services and facilities such as POS, and public transport routes, and;

3. Located to enhance passive surveillance of public spaces.

6.4.8. Aged Persons Accommodation/Independent Living

Specific sites for such a facility have not been identified on the Branch Circus DSP. However, to ensure the design of any proposed aged person's accommodation integrates with the surrounding urban fabric the following principles apply in the preparation of Detailed Area Plans:

1. Located so as to maximise access to and use of services and facilities such as public open space, centres and public transport routes;

2. Development to address and survey surrounding public streets, with visually permeable fencing and major openings addressing the street;

3. Development integrated with surrounding land uses, including pedestrian access and permeability; and

4. Any community/shared facilities to address the primary street.

Detailed Area Plans will be required to be prepared for aged persons/ independent living sites in accordance with these principles at subdivision stage.

6.5. Education Facilities

The Branch Circus DSP does not provide an sites for educational facilities, which is consistent with the Department of Education and Trainings planning within the area. The DSP area will be serviced by the Jandakot Primary School which is located east of Hammond Road on Carmel Way. A four way intersection exists at Hammond Road and Darlot Avenue/Carmel Way to provide good access to this primary school from the Branch Circus DSP area.

Atwell College is the public high school serving the DSP area. Access from the DSP area to this site will be via Bartram Road once the overpass is constructed over the Freeway. Students will also have the option of attending Lakelands Senior High School within South Lake providing there are places. Despite the access difficulty from the DSP area to Atwell College, this school is likely to be the preferred option of most residents due to the high standard of its facilities.

Emmanuel Catholic College is approximately 1.0 km from the site at the intersection of Beeliar Drive and Hammond Road.

6.6. Commercial Facilities

The Branch Circus DSP does not identify any commercial centres within the DSP area. This is consistent with the *City of Cockburn Local Commercial Strategy*, which identifies the closest existing Local Centre north of the Branch Circus DSP. This Local Centre currently only consists of a small delicatessen collocated with a caravan park. The Strategy identifies the Local Centre as having a future capacity of 1,200 shop retail floorspace. The location of this expanded Local Centre is likely to change and will be determined as part of future structure planning process for the surrounding area.

The Strategy also identifies a proposed a Neighbourhood Centre further south on the corner of the realigned Russell Road and Macquarie Boulevard.

Gateways Shopping Centre, located 1.8km to the north-east of the structure plan area, is classified as a Secondary Centre under SPP4.2 and is the closest regional level centre to the Branch Circus DSP area.

It is considered that the proposed and existing centres outlined in the *City of Cockburn Local Commercial Strategy* and SPP4.2 will provide adequate commercial facilities for the future community of Branch Circus.

6.7. Community Facilities

The Branch Circus DSP does not allocate land for community facilities; however the area is well serviced by community facilities located in proximity to the DSP areas. The DSP area lies within:

- 1.8km from the Cockburn Central Youth Centre adjacent to Gateways Shopping Centre and the Success Library in the Gateways Shopping Centre.
- 400m from the Hammond Road District Sports Facility (Cockburn Sporting Club) located south of Bartram Road. This facility includes netball courts, tennis courts, playing fields and clubrooms.
- Immediately adjacent to Jandakot West A.B.C. Developmental Learning Centre, located at the intersection of Carmel Road and Hammond Road and within 500m of two other childcare centres.

The adjacent Beeliar Regional Park also provides excellent recreation opportunities such as walk trails with viewing platforms and a bridle trail**.** A dual use path has already been constructed parallel to Branch Circus and this forms part of a larger walk trail for the Beeliar Regional Park.

6.8. Parks and Recreation

The Branch Circus DSP provides a network of well distributed parks that offer a variety of safe, appropriate and attractive POS. The Branch Circus DSP identifies three areas of POS, two within the foreshores of the CCW wetlands and one centrally located POS.

The neighbourhood and local parks identified in the Branch Circus DSP provide for the conservation of remnant vegetation and the provision of active and passive POS.

The location of POS is based on the following:

1. Securing and enhance the environmental features including wetlands and remnant vegetation;
2. Along ownership boundaries to enable owners to be able to satisfy their 10% POS requirements within their own land holding;
3. To ensure all residential areas are located within walking distance of a local park;

The Branch Circus DSP allocates POS areas based on the above principles. **Table 2** below contains the Branch Circus DSP POS Schedule and should be read in conjunction with **Figure 11 – Public Open Space Strategy**. These areas of POS can be refined as part of the local structure planning process.

POS credits will be determined in accordance with the relevant WAPC policies, practices and legislation at the LSP and subdivision stage.

The Branch Circus DSP requires that where ever possible established trees should be incorporated into future development either in parks or road reserves.

Established trees will assist in giving additional character as well as providing shade opportunities which are often lacking in new estates.

Table 2 -Branch Circus DSP Public Open Space Schedule		
Site Area		37.501 ha
Less		
Land Not suitable for Urban Development or Closer Settlement (Lots 2, 3, 4 and 9000 Branch Circus)	11.401 ha	
Conservation Category Wetland	1.961 ha	
Existing Roads *	2.671 ha	
Restricted Open Space (above 20% threshold)	3.266 ha	
Total	19.299 ha	
Net site area		18.202 ha
Deductions		
Water Corporation Pipe Line (Public Purpose)	0.580 ha	
Special Use – Swimming Pool	0.396 ha	
Regional Open Space	0.075 ha	
Dedicated Drainage Reserve (1:1yr ARI)	0.175 ha	
Total	1.226 ha	
Gross Subdivisible Area		16.976 ha
Public Open Space @ 10 %		1.698 ha
Public Open Space Contribution		
May Comprise:		
minimum 80% Unrestricted Open Space	1.358 ha	
maximum 20% Restricted Open Space	0.340 ha	
Unrestricted Open Space		
POS 1	0.139 ha	
POS 2	0.037 ha	
POS 3	0.073 ha	
POS 4	0.560 ha	
POS 5	0.600 ha	
POS 6	0.062 ha	
POS 7	0.012 ha	
Total Unrestricted Public Open Space	1.483 ha	
Restricted Open Space		
Conservation Category Wetland Buffer	3.578 ha	
Drainage (1:5yr ARI)	0.019 ha	
Total Restricted Use Public Open Space	3.597 ha	
Total Restricted Use Public Open Space contribution (ie 20% of 1.655 ha)	0.340 ha	
Public Open Space Provision		1.822 ha

*Note: The Branch Circus Road Reserve which contains the constructed section of Branch Circus is excluded from the POS Schedule Site Area. Though the Branch Circus Road Reserves lies within the DA13 it is considered extraneous to the urban development area and a legacy of past access arrangements for the area.

DRAINAGE				
Drainage	1:1 yr ARI Inundation Area (m²)	1: 5yr ARI Inundation Area (m²)	1: 100yr ARI Inundation Area (m²)	Total Inundated Basin Area (m²)
D1	135	305	370	370
D2	475	475	475	475
D3	115	115	115	115
D4	225	225	225	225
D5	190	190	190	190
D6	525	525	525	525
D7	275	275	275	275
Total	*1940*	*2110*	*2175*	*2175*

Structure Plan Boundary

OPEN SPACE
- Local (Unrestricted)
- Local (Restricted)
- Regional (Restricted)
- Conservation Category Wetland (Restricted)

- Not Suitable for Urban Development or Closer Settlement
- Drainage
- 50m CCW Buffer

City of Cockburn
wetlands to waves

GNA 9/12

0 100m
SCALE 1:5,000

PUBLIC OPEN SPACE STRATEGY

BRANCH CIRCUS
DISTRICT STRUCTURE PLAN, SUCCESS

FIGURE 11

6.8.1. Neighbourhood/Local Public Open Space – design and embellishment

These parklands are intended to serve the regular small scale needs of the immediate residential population within a five to ten minute walking distance. The predominant use should be for informal recreation for individuals and households, especially low level children's play, dog walking and relaxation. They are not intended for any form of active sport and should not therefore warrant additional parking.

Embellishment with infrastructure pitched above this role will not be accepted. Similarly, design of these parklands which have higher than average (for the City of Cockburn) maintenance or whole of life cycle costs will not be accepted.

The types of supporting amenities could include paths, shade, seating, children's play spaces.

6.8.2. Wetland Buffers

The POS located within the 50m buffer to the CCWs shall be designed and managed with the objective of securing and enhance the environmental value of the wetlands and remnant vegetation. The detailed design of the CCW buffer shall address environmental considerations such as maintaining ecosystem stability, filtering polluted/nutrient rich runoff, reducing outward spread of midges, reducing the spread of rubbish into the wetland and reducing outward disturbance of fauna by human activities.

6.8.3. Neighbourhood/Local Public Open Space – ongoing planning

The following additional information will be provided as part of a Public Open Space Strategy to be undertaken at the local structure plan stage:

- Preliminary landscape design concepts setting out key design features and principles;
- Landscape management regime and asset cost schedule;
- Strategies for weed and nutrients management and wetland buffer remediation;
- Design principles within bushfire protection zone (30m) within areas of POS; and
- Landscape management requirements to maintain fuel load limits.

A Wetland Management Strategy will be required as part of any future subdivision application to ensure ongoing appropriate management arrangements are in place to protect wetlands.

6.9. Lots 2, 3, 4 and 9000 Branch Circus

Development of Lots 2, 3, 4 and 9000 Branch Circus for urban land uses, such as residential, or any closer settlement, is constrained primarily by the configuration of CCWs and their buffers over these lots. There are additional planning considerations affecting these lots, including bush fire risk, interface issues with the Beelier Regional Reserve, and integration with the surrounding urban context.

Development of these lots for urban development or closer settlement would have significant negative environmental impacts, create ongoing management

requirements to minimise the impact of development on Beeliar Regional Park, potentially place future residents at high bush fire risk, and create dislocated pockets of development. For these reasons these lots have been identified on the Branch Circus DSP as being 'Constrained Sites'.

The City supports the rezoning of Lots 2, 3, 4 and 9000 Branch Circus for Reservation – Parks and Recreation under the Metropolitan Region Scheme. Should reservation of the land under the Metropolitan Region Scheme not be successful, the land would alternatively be suitable for inclusion within the Conservation Zone under the City's Town Planning Scheme. Such an arrangement could be by way of a future Structure Plan.

6.10. Special Use Zone – Swimming Pool

A swimming school facility on Lot 125 Hammond Road was approved in 2010. Accordingly, a Special Use zoning has been applied to the affected portion of the Lot 125 Hammond Road under the Branch Circus DSP.

6.11. Planning for Bush Fire Protection

The Branch Circus Fire Management Strategy (FMS) (FirePlan 2011) was prepared to reduce the threat to residents and fire fighters in the event of bush fire within or near the DSP area.

Key component of the FMS are;

- A road interface between residential areas and the areas of POS.
- Fire hydrants installed every 200m apart in roads that interface with POS.
- A 30m building protection zone between the residences and the classified vegetation, which is a low fuel area that can include road reserves, building setbacks, and POS.
- New dwellings to be designed and built to conform with *Australian Standard - Construction of buildings in bushfire-prone areas* (AS 3959-2009) and specifically the Bushfire Attack Level (BAL) based on the distance between the dwelling and the classified vegetation within the POS and CCW.

The following design solutions have been applied to the Branch Circus DSP to reduce fire risk in accordance with the 2011 FMS;

- Provision of road separation to the Beeliar Regional Reserve and wetland areas wherever possible. These perimeter roads will separate building/residents from bush fire hazards in the future.
- Multiple access points have been provided to Hammond Road together with a legible and permeable street network to minimize risks and provide suitable access/egress in the event of a fire.
- The number of cul-de-sacs has been limited and where they are provided, they are limited in length.
- POS areas have been located to form a separation zone between fire risk vegetation and future residential development.

Bush fire management will need to be considered as part of the local structure planning process and will need to address the recommendations of Branch Circus FMS 2011. Addressing bush fire risk could potentially involve landscape design

and management measures with POS areas and/or modification to the urban structure proposed under the Branch Circus DSP.

There is potential conflict between the bush fire management objectives for the Branch Circus DSP and the water management objectives for the site, as outlined in Section 5. In particular fuel load reduction within the 30m building protection zone may be inconsistent with the need to avoid the use of turf within POS areas and CCW buffers, in order to reduce the potential for transfer of nutrients to wetlands via surface runoff and/or groundwater. WSUD principles would require the use of natural vegetations within buffers to CCWs. These potential conflicts will need to be resolved as part of the local structure planning process.

7. SERVICING INFRASTRUCTURE

7.1. Sewerage

There is currently no Water Corporation sewerage infrastructure within structure Branch Circus DSP area. However, the Thomsons Lake Sewerage Reticulation Conceptual Planning for the area indicates sewer mains that are proposed within the DSP area. The Water Corporation should be consulted with regards to the route of the proposed DN600 sewer crossing the site.

The site is planned to gravitate, to the west split into two catchments with the lots connected to the main sewer via two Dn150 sewer connections (Refer to **Appendix 6)**.

7.2. Water

The structure plan area lies within the existing Thomsons Lake Water Supply Scheme and is bounded by a number of large bore watermains. The Water Corporation advised that the structure plan area will be serviced from the 600S Hammond Road main (Refer to **Appendix 6)**.

7.3. Power

It is most likely that the Branch Circus DSP area will be serviced via one of the feeders out of the 22kV Cockburn Cement Zone Substations, which is located 6.8km away from the DSP area. The estimated design load is approximately 2.45 MVA, which could occur in four dates over six years.

Hammond and Russell Road East are the most likely feeders to supply the proposed development. The surrounding Bibra Lake feeders may also be able to indirectly assist if required.

There is sufficient capacity available to supply the proposed development, however there may be potential under voltage issues at the end of the feeder (end of Hammond Road). This may not be an issue once the weak conductors in the area are pulled down.

Due to the dynamic nature of the distribution network, further studies for network reinforcement would be required at the time of subdivision to determine the final network requirements (Refer to **Appendix 6)**.

7.4. Gas

There is currently no AlintaGas infrastructure within the Branch Circus DSP area. A 160 medium pressure main extends along the eastern side of Hammond Road.

AlintaGas advises there are currently no plans to extend gas service into this area and future applications for gas services will be considered on a case by case basis.

AlintaGas reviews the provision of gas on a case by case basis and thus cannot provide additional information regarding future infrastructure installations without first undertaking an economic evaluation of a proposed subdivision.

It is anticipated that AlintaGas infrastructure will be extended from the 160 MP main in Hammond Road (Refer to **Appendix 6)**.

7.5. Telecommunications

Telstra has confirmed that there is an existing Optic Fibre Cables running along Hammond Road. Telstra also plans expansion of their infrastructure to suit on-going development and thus has no planning information for this area (Refer to **Appendix 6)**.

7.6. Drainage

Drainage within the Branch Circus DSP area will be guided by the Branch Circus DWMS. The DWMS will be used to guidance the preparation of LWMS and Water Management Plans to be prepared for land parcels within the area at the local structure planning and subdivision approval stage. Refer to **Appendix 4** for the DWMS Report.

The DWMS was prepared using the Department of Water's (DoW) guiding document *Better Urban Water Management*.

7.7. Roads

The existing Branch Circus and Gadd Street are currently constructed to rural standards. In accordance with normal practice, developers will be required to pay the cost of upgrading these roads to residential standards. The normal formula applied is that owners pay half the cost of upgrading that section which abuts a landowner's property including any required traffic management devices.

Individual landowners/developers are required to construct roads as part of their subdivision.

Hammond Road will be upgraded (second carriageway) as part of the requirements of Development Contribution Area 1 (Success North), (Refer to **Appendix 6)**.

8. IMPLEMENTATION

An implementation schedule is included as **Table 3** which details required works and reporting required to implement the Branch Circus DSP through the various planning stages.

8.1. Metropolitan Region Scheme Zoning

The subject land is zoned Urban and 'Urban Deferred' under the provisions of the MRS The August 2011 version of the Branch Circus District Structure Plan lead to the lifting of the urban deferment across all land identified as urban on that plan on 12 February 2012.

Following adoption of the August 2011 Branch Circus District Structure Plan the WAPC on 12 February 2012 lifted the deferment of all land shown for urban purposes on that plan.

8.2. City of Cockburn Town Planning Scheme Zonings

The Branch Circus DSP area is zoned 'Development' in TPS3 which requires, subdivision and development to be in accordance with a Structure Plan adopted pursuant to Section 6.2 of the TPS3. The Branch Circus DSP sets the general framework, however it will still be necessary for individual or groups of owners to prepare a LSP for their land.

8.3. Development Area and Development Contribution Area requirements

Development Areas within the City are the subject of specific requirements set out in Schedule 11 (Development Areas) and Schedule 12 (Development Contributions) of TPS3.

8.3.1. Designation of Development Area requirements

The Branch Circus DSP area lies within Development Area 13 (DA13). The DA13 provisions contained in Schedule 11 of TPS3 state that the development is to provide for Residential development.

The northern portion of DA 13 (lots 768, 778, 779 & 780 Hammond Road and Branch Circus, Success) have already undergone Structure Planning/subdivision approval and is already zoned 'Urban' under the MRS.

8.3.2. Designation of Development Contribution Area requirements

The Branch Circus DSP lies within Development Contributions Area 1 (DCA1) which requires that all landowners within DCA area make a proportional contribution to the widening and upgrading of Hammond Road between Beeliar Drive and Bartram Road, Success.

The Branch Circus DSP also lies within Developer Contributions Area 13. In accordance with *State Planning Policy 3.6 - Development Contributions for Infrastructure*, the City, through Amendment No. 81 to TPS3, implemented a new Developer Contributions Plan for community infrastructure (DCP 13). This applies to all land within the City to be subdivided and/or developed for residential, rural residential or resource zone purposes and will be in addition to any other DCA requirements applying to an area

POS has been allocated on the basis that the areas to be provided represent approximately 10% of the subject properties.

8.4. Planning Control

The Branch Circus DSP allocates land use activities and will form the basis of assessing detailed proposals for individual properties. The DSP is a "guiding document" adopted by the Council and is not a structure plan adopted pursuant to section 6.2.9 of the City's TPS3. Therefore land uses and zones are not given the full effect as though they are part of the TPS3.

To progress the subdivision and development of a land holding it will be necessary for landowners or groups of small landowners to prepare and submit a detailed LSP and supporting report for their land. Each structure plan should be

generally in accordance with the Branch Circus DSP, and should show detail including the proposed road and lot layout, detail areas of POS, densities and other information set in the Development Area provisions of TPS3.

Any significant departures from the Branch Circus DSP would need to be identified and justified. All local structure plans are to be adopted by Council and endorsed by the WAPC in accordance with the Development Area provisions of the TPS3.

Table 3 – Branch Circus DSP Implementation Schedule

Implementation Stage	Issues	Required Works and Reporting	Responsibility	
			Preparation	Approval
Preparation of Local Structure Plan	**Site Investigations**			
	Possible uncontrolled fill	Geotechnical Survey	Landowner	
	Possible soil contamination from past agricultural and horticultural uses.	Soil contamination surveys	Landowner	
	Possible unrecorded sites of indigenous heritage.	Archaeological and ethnographic survey	Landowner	
	Acid Sulfate Soils	Site Investigations as part of Local Water Management Strategy	Landowner	CoC & WAPC
	Water Management			
	Water Conservation Initiatives	Investigation as part of Local Water Management Strategy	Landowner	CoC & WAPC
	Application of WSUD initiatives to; • reduce basins and promote infiltration closer to source; and • improve storm water and ground water quality.	Investigation as part of Local Water Management Strategy	Landowner	CoC & WAPC
	Ground water levels and flooding	Investigation as part of Local Water Management Strategy	Landowner	CoC & WAPC
	Public Open Space			
	Embellishment and design	Preparation of a Public Open Space Strategy as part of the Local Structure Plan; including; • Preliminary landscape design concepts setting out key design features and principles, • Landscape management regime and asset cost schedule;	Landowner	CoC & WAPC
	Interface issues with CCWs and Beelier Regional Park.	Preparation of a Public Open Space Strategy as part of the Local Structure Plan; including; • Strategies for weed and nutrients management and wetland buffer remediation.	Landowner	CoC (taking advice from DEC) & WAPC
	Fire management	Preparation of a Public Open Space Strategy as part of the Local Structure Plan; including; • Design principles within bushfire protection zone (30m) within areas of POS; • Landscape management requirements to maintain fuel load limits.	Landowner	CoC, WAPC & FESA
	Fire risk	Local Fire Managements Strategy as part of Local Structure Plan Report	Landowner	CoC & WAPC
	Staging	Staging Plan within Local Structure Plan outlining strategy for roll out of development, including consideration of development in surround landholdings within the District Structure Plan.	Landowner	CoC & WAPC
Subdivision Applications	Water Management	Preparation of a Urban Water Management Plan	Landowner	CoC & WAPC
	Wetland Management	Wetland Management Strategy	Landowner	CoC & WAPC
	Fire Risk	Preparation of an Interim Fire Management Plan to be implemented during the construction phase of the development	Landowner	CoC, WAPC & FESA

APPENDIX 1

Letter from Department of Environment and Conservation regarding wetland classification determination

Government of **Western Australia**
Department of **Environment and Conservation**

Our ref: DEC 2038
Enquiries: Anne Shanahan
Phone: 08 9219 8740
Fax: 08 9219 8750
Email: anne.shanahan@dec.wa.gov.au

Mario Carbone
City of Cockburn
PO Box 1215
BIBRA LAKE WA 6965

Dear Mario,

RE: REQUEST TO MODIFY THE *GEOMORPHIC WETLANDS SWAN COASTAL PLAIN* DATASET FOR LAND BOUNDED BY HAMMOUND ROAD, BEELIAR REGIONAL PARK AND THE BARTRAM ROAD BUFFER LAKES, SUCCESS (UFI 6535 AND 13957).

I refer to your correspondence of 19 August 2009 requesting modification of the *Geomorphic Wetlands Swan Coastal Plain* dataset ('dataset') for the above location. DEC Wetlands Section has reviewed the information provided by both City of Cockburn and RPS, conducted a site assessment (18 May 2009) and provides the following assessment of the request.

Portions of wetland UFI 6535 and 13957 (Lots 12 and 13 Hammond Road, Lot 4 Branch Circus) that are devoid of vegetation or contain vegetation in Completely Degraded condition will be modified to Multiple Use management category.

Vegetated portion of wetland UFI 6535
The vegetated portion of Resource Enhancement sumpland UFI 6535 will be modified to Conservation management category due the following important values:

- it is adjacent to and ecologically connected to the internationally important Thomsons Lake Ramsar Site;
- vegetated portions of the wetland are included in *Bush Forever* site 391 (Thomsons Lake Nature Reserve and Adjacent Bushland);
- greater than 80% of the wetland's vegetation is in a Very Good condition;
- identified in the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*;
- identified as an Environmentally Sensitive Area under Schedule 5 of the *Environmental Protection (Clearing of Native Vegetation) Regulations*, 2004; and
- representative of the Bassendean Central and South vegetation complex, which has less than 27% remaining intact on the Swan Coastal Plain (West Australian Local Government Association 1994).

Vegetated portion of wetland UFI 13957
As illustrated by RPS in the request, wetland UFI 13957 supports vegetation in Good to Very Good condition, is hydrologically connected to Thomsons Lake Ramsar Site and in addition has important ecological linkages and habitat value. As such, the portion of wetland UFI 13957 on Lot 22 and 9000 Hammond Road is considered to still be consistent with a management category of Conservation. DEC Wetlands Section concurs

with City of Cockburn's recommendation that the current boundary of wetland UFI 13957 is an accurate reflection of the wetland extent.

Please find enclosed a map illustrating the modifications to the dataset for Branch Circus. The dataset will be updated to reflect these modifications in its next quarterly update. Please contact Anne Shanahan on 9219 8740 if you require further information on this matter.

Yours sincerely,

Dr. Michael Coote
Principal Coordinator
DEC Wetlands Section

25 June 2010

Cc: Luke Rogers, Supervising Scientist, RPS Consultancy

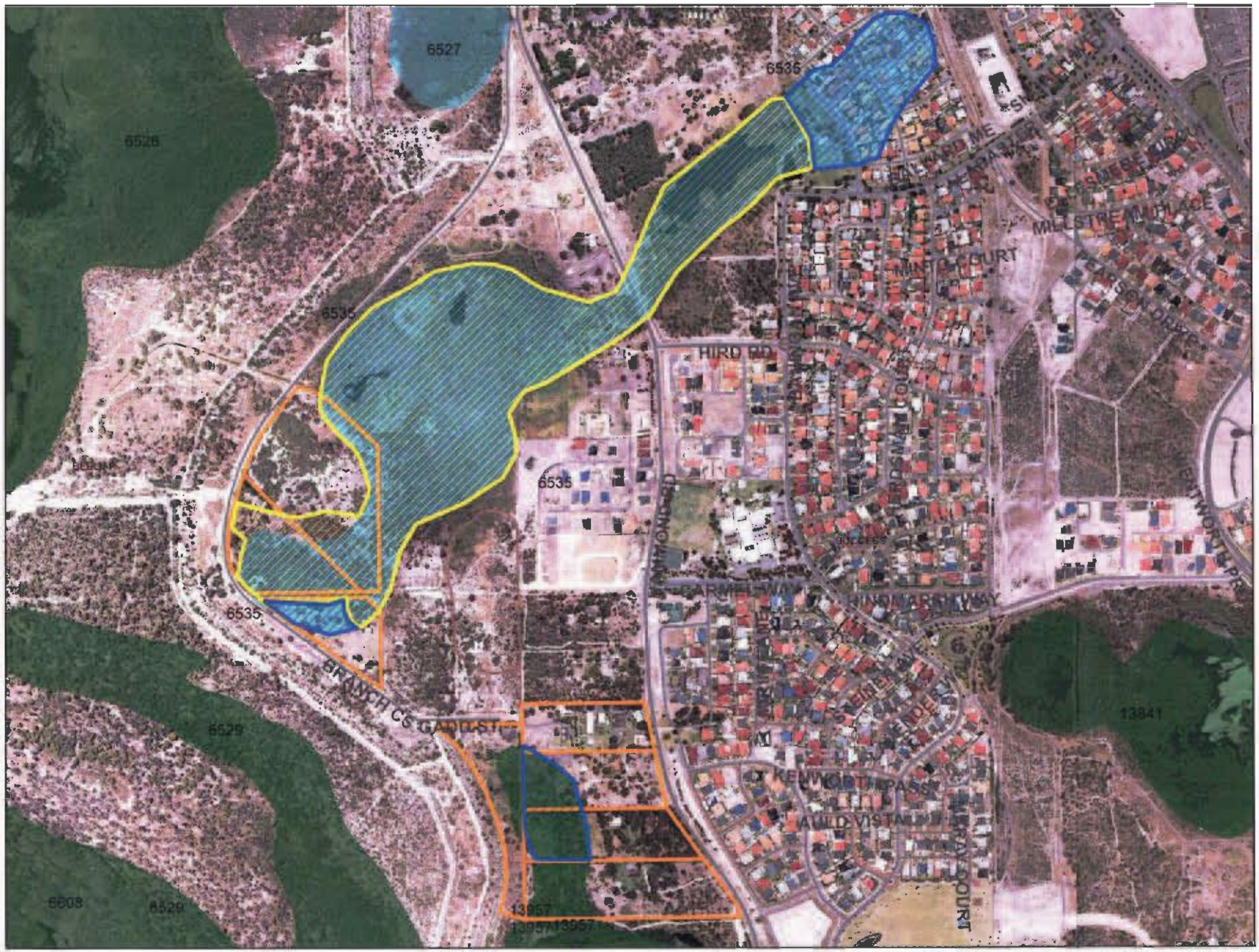
Enc: Map illustrating Modification to the *Geomorphic Wetlands Swan Coastal Plain* dataset for Branch Circus

References:

Environmental Protection Authority 1993, *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992*, EPA, Perth

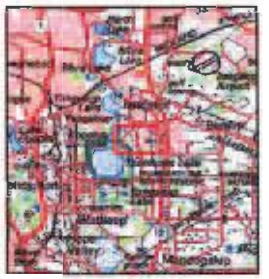
West Australian Local Government Association 1994, *Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region*. West Australian Local Government Association, Perth

Modification: Branch Circus (Wetland UFI 6535 and 13957)



Legend

- Modification Properties
- *Geomorphic Wetlands Swan Coastal Plain*
- Current Conservation boundary
- Current Resource Enhancement boundary
- Modified: Conservation boundary
- Modified: Multiple Use boundary



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Department of Environment and Conservation
Our environment, our future

Produced under the Direction of
Keiran McNamara
Director General, Department of
Environment and Conservation

0 145 290 580 870 1,160
Meters

APPENDIX 2

Flora and Fauna Survey -

Branch Circus and Hammond Road Success (RPS 2008)

(refer to separate report)

APPENDIX 3

Environmental Assessment Report -

Branch Circus and Hammond Road Success (RPS 2008)

(refer to separate report)

APPENDIX 4

Fire Management Plan - Branch Circus Success

(FirePlan 2011)

APPENDIX 5

DA 13- Branch Circus

District Water Management Strategy (Cardno 2011)

(refer to separate report)

APPENDIX 6

Development Area 13 (Hammond Road)

Servicing Report (SKM 2008)

(refer to separate report)