Structure Plan Report

Cockburn Central West Structure Plan

P05002



Prepared for
LandCorp

November 2016

Taylor Burrell Barnett

Cardno
Shaping the Future

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ENDORSEMENT PAGE

This structure plan is prepared under the provisions of the City of Cockburn Local Planning Scheme No. 3

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

20 October 2014

In accordance with Schedule 2, Part 4, Clause 28 (2) and refer to Part 1, 2. (b) of the *Planning and Development (Local Planning Schemes) Regulations 2015.*

Date of Expiry: 1**9 October 2037**

Table 1. Table of variations to Part One (Implementation) and Structure Plan Map

Amendment No.	Summary of the Amendment	Amendment Type	Date Approved by WAPC
1	Amend zoning table and associated text. Removal of road reserve south of Parks and Recreation Reserve. Amend Public Open Space Plan and schedule.	Minor	

Prepared for: LandCorp

Prepared by: Cardno/Taylor Burrell Barnett

In Association with: GHD
Pritchard Francis/Arup
RPS
Urbis
Urbsol

Executive Summary

The Cockburn Central West (CCW) Structure Plan has been prepared by Cardno, Urbis, GHD, RPS and Pritchard Francis/Arup for LandCorp, which is managing the strategic planning for CCW on behalf of the Western Australian Planning Commission, owner of the majority of the CCW site. A small portion of land in the south-west corner (used for drainage) is owned by the City of Cockburn.

CCW comprises part of the Cockburn Central Regional Centre, which is defined as a 'secondary centre' underDirections 2031 and Beyond andState Planning Policy (SPP) 4.2 – Activity Centres for Perth and Peel. CCW (also referred to as the site) is located immediately to the west of the Cockburn Central Town Centre, which is currently being developed. CCW is bound by North Lake Road to the north, Midgegooroo Avenue to the east, Beeliar Drive to the south and Poletti Road to the west.

The CCW Structure Plan proposes open space, recreational and mixed use (residential, commercial and retail) development consistent with an activity centre that promotes a mixture of compatible land uses. In accordance with original planning for the site, the Structure Plan provides an open space focus within the central portion of the site.

The Structure Plan for CCW is based on delivering the following project vision:

"An innovative mixed use development integrating regional recreational aspirations into the existing landform and surrounds whilst extending the urban fabric of the highly successful Cockburn Central Town Centre."

A key use that will deliver the recreational function of the site is the proposed Integrated Regional Recreational Facility to be developed by the City of Cockburn. It is proposed to be a purpose–built facility with strong linkages to the adjacent primary AFL oval (located within the Public Purposes – Community Reserve) and the multi-purpose community open space area (playing fields) that will be shared with other sporting and tertiary education institutions. It will deliver a range of facilities, in particular an indoor and outdoor aquatic centre.

The CCW Structure Plan is preceded by the Draft Thomsons Lake Regional Centre Master Plan, prepared by Cardno (then BSD Consultants) in mid-2001. The Draft Structure (Master) Plan was advertised concurrently with the advertising of MRS Amendments 1038/33 (Thomsons Lake Regional Centre) and 1032/33 (South-West Metropolitan Transit Route) in February 2002.

The City of Cockburn resolved in March 2002 to support the Draft Thomsons Lake Regional Centre Master Plan. The Department of Planning/WAPC subsequently advised that the Draft Structure Plan was acceptable as the basis for more detailed planning in the area, and in 2002 Amendment 1038/33 was gazetted.

In 2004, the City of Cockburn initiated Amendment 1 to Town Planning Scheme No. 3. The purpose of Amendment 1 was to rezone the Cockburn Central Town Centre to 'Regional Centre' and to insert various text provisions into the Scheme. These provisions apply specifically to Development Areas 23 and 24 of the Scheme. Development Area 23 refers to the Town Centre Precinct (comprising Cockburn Central Town Centre and CCW), whilst Development Area 24 refers to the Gateways Precinct. The Amendment was gazetted in 2007.

In accordance with the requirements of the Scheme, a Structure Plan is required for CCW to guide subdivision, land use and development. The Structure Plan comprises two parts - Part One containing the Structure Plan Map and Part Two containing all supporting information. There is also an appendix section in Part Two which contains the various technical reports.

A wide range of technical reports have been prepared to support the CCW Structure Plan, including a flora and fauna survey, a transport assessment, traffic impact analysis, local water management strategy and servicing strategy. The findings of these technical reports have influenced the final structure plan design for CCW.

The following table provides a breakdown of the key Structure Plan outcomes including land uses and proposed zones as well as future population and residential projections.

Table 2. Structure Plan Summary Table

Item	
Total area covered by the Structure Plan	32.53 hectares
Land area of specific land uses (zones and reserves):	
> Mixed Use – Residential, Retail and Commercial	5.7 hectares
> Mixed Use – Residential/Commercial	3.47 hectares
> Mixed Use – Retail/Commercial	1.23 hectares
> Total land area of Mixed Use Zones	10.4 hectares
> Public Purposes – Community (Integrated Facility and Primary AFL Oval)	5.63 hectares
> Public Purposes - Utilities/Infrastructure	6.5 hectares
> Park, Recreation and Conservation - Public	3.4 hectares
> Park, Recreation and Conservation - Drainage	1.7 hectares
Estimated number of dwellings	Approximately 1000 dwellings (approximately 70% to 80% of the Mixed Use Zones)
Estimated population	1,800 (based on household size of 1.8)
Estimated retail/commercial floorspace	Approximately 20,000m^2 (gross floor area) (retail component approximately 3000m^2 to 4000m^2)
Integrated Community Facility	Approximately 23,500m^2 (gross floor area)

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COCKBURN
CENTRAL WEST
STRUCTURE PLAN

PART ONE
IMPLEMENTATION



1 Structure Plan Area

Part One – Implementation applies to the Cockburn Central West Structure Plan, consisting of all land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map (**Plan 1**).

The CCW Structure Plan Area is bounded by North Lake Road to the north, Midgegooroo Avenue to the east, Beeliar Drive to the south and Poletti Road to the west, as denoted on the Structure Plan Map.

The Structure Plan Area comprises a number of individual lots, as outlined in the table below:

Table 1. Site Details

Lot Number	Plan Number	Street Address	Area
1	D13057	Lot 1 North Lake Road, Cockburn Central	1.6902ha
53	P9782	Lot 53 North Lake Road, Cockburn Central	1.5237ha
54	P9782	Lot 54 Poletti Road, Cockburn Central	3.8228ha
55	D13057	Lot 55 North Lake Road, Cockburn Central	0.6106ha
804	P35222	Lot 804 Beeliar Drive, Cockburn Central	1.4581ha
1001	D83944	Lot 1001 Beeliar Drive, Cockburn Central	0.2524ha
9504	P57009	Lot 9504 Beeliar Drive, Cockburn Central	21.419ha
Road to be closed (North Lake Road)			1.7554ha

The Structure Plan Area also includes a section of road (North Lake Road) to be closed in the north-east corner of the site.

2 Structure Plan Content

The Structure Plan comprises the following:

a. Part One – Implementation

This section contains the Structure Plan Map and planning provisions and requirements.

b. Part Two – Explanatory (Non-Statutory) Section

This section is to be used as a reference guide to interpret and justify the implementation of Part One. c. Appendices – Technical Reports and Supporting Plans and Maps.

3 Interpretation and Relationship with the Scheme

Unless otherwise specified in this part, the words and expressions used in the CCW Structure Plan shall have the respective meanings given to them in the City of Cockburn Town Planning Scheme No. 3 (the Scheme) including any amendments gazetted thereto.

The Structure Plan Map (**Plan 1**) outlines land uses, zones and reserves applicable within the Structure Plan Area.

Where terms are not defined in the Scheme, the meanings shall be as set out within Part One of the CCW Structure Plan.

In the Structure Plan, unless the context otherwise requires:

> **'Scheme'** means City of Cockburn Town Planning Scheme No. 3.

> **'Retail'** means the sale or hire of goods or services to the public as defined in the Scheme.

> **'Commercial'** means business-type uses such as offices, banks, consulting rooms or medical centres, which are non-residential and non-retail in nature.

> **'Structure Plan'** means Cockburn Central West Structure Plan.

> **'Active Land Uses'** means non-residential land uses that create activity between the public realm and development and encourages interest and maximises economic and social transactions

> **'Landmark sites'** means sites that are developed with key buildings serving as focal points and accommodating a mixture of land uses, where possible. Buildings on landmark sites are to be architecturally designed so as to express the importance of a particular location.

> **'Parcel'** means blocks of Mixed Use zoned land as identified and numbered on the Structure Plan.

4 Operation

1. Pursuant to Schedule 2, Part 4, Clause 22 of the Planning and Development (Local Planning Schemes) Regulations 2015, the Structure Plan shall come into operation on the day on which it is endorsed by the Western Australian Planning Commission.

5 Land Use

The Structure Plan Map (**Plan 1**) outlines the zones and reserves applicable within the Structure Plan Area.

5.1 Objectives of the Zones

The objectives of the zones are:

a. **Mixed Use – Residential, Retail and Commercial**

To provide for the co-location and development of a wide range of compatible land uses that are residential, retail or commercial in nature to be developed within one lot or over a number of adjacent lots.

b. **Mixed Use – Residential/Commercial**

To provide for the co-location and development of residential and commercial land uses to be developed within one lot or over a number of adjacent lots. Some retail development will be permitted in areas identified for active retail land uses on the Structure Plan.

c. **Mixed Use – Retail/Commercial**

To provide for the co-location and development of retail and commercial land uses.

Residential development may be permitted.

5.2 Land Use Permissibility

Land use class permissibility for all zones within the CCW Structure Plan is provided for in the Zoning Table (Table 2).

The symbols used in the cross reference in the Zoning Table (P, X, D, A) have the same meanings as specified in Clause 4.3.3 of the Scheme.

Table 2. Zoning Table

Use Class		Zones		
		Mixed Use – Residential, Retail and Commercial	Mixed Use – Residential/Commercial	Mixed Use – Retail/Commercial
RESIDENTIAL USES				
Ancillary Accommodation (R-Code)		X	X	X
Bed and Breakfast		A	A	A
Child Care Premises		D	D	D
Civic Use		P	P	P
Dwelling	Aged or Dependent	X	X	X
	Caretaker's	X	X	X
	Grouped (R-Code)	D (refer to Note 1)	X	D
	Multiple (R-Code)	P	P	D
Educational Establishment		D	D	D
Home Business		X	X	X
Home Occupation		D	D	X
Home Office		P	P	X
House: Lodging		A	A	X
Single (R Code)		X	X	X
Institutional Building		A	A	A
Place of Worship		D	D	D
Residential Building (R-Code)		D	D	D
Tourist Accommodation		D	D	D

Use Class		Zones		
		Mixed Use – Residential, Retail and Commercial	Mixed Use – Residential/Commercial	Mixed Use – Retail/Commercial
COMMERCIAL USES				
Commercial	Bank	P	P	P
	Garden Centre	X	X	X
	Market	D	D	D
	Nursery	X	X	X
	Office	P	P	P
	Showroom	X	X	X
	Veterinary Consulting Rooms	A	A	A
Entertainment	Amusement Parlour	D	D	D
	Betting Agency	D	D	D
	Club Premises	D	D	D
	Fast Food Outlet	P	P	P
	Hotel/Tavern	A	A	A
	Motel	X	X	X
	Public Amusement	D	D	D
	Reception Centre	A	A	A
	Recreation – Private	D	D	D
	Restaurant	P	P	P
Health Services	Consulting Rooms	P	P	P
	Health Studio	D	D	P
	Medical Centre	P	P	P
	Hospital	A	A	A

Use Class		Zones		
		Mixed Use – Residential, Retail and Commercial	Mixed Use – Residential/Commercial	Mixed Use – Retail/Commercial
Shop	Convenience Store	D	D	D
	Lunch Bar	P	P	P
	Shop	P	P	P
	Home Store	X	X	X
Transport	Commercial Vehicle Parking	X	X	X
	Motor Vehicle, Boat or Caravan Sales	X	X	X
	Motor Vehicle Hire Premises	D	D	D
	Motor Vehicle Wash	X	X	X
	Petrol Filling Station	X	X	X
	Service Station	X	X	X
Animal Establishment		X	X	X
Cinema/Theatre		D	D	D
Funeral Parlour		X	X	X
Hardware Store		X	X	X
Night Club		A	A	A
Restricted Premises		X	X	X
Trade Display		X	X	X
Veterinary Centre		A	A	A
Vehicle - Disused		X	X	X
INDUSTRIAL USES				
All Industrial uses listed within the City of Cockburn Town Planning Scheme No.3 are prohibited.		X	X	X
RURAL USES				
All Rural uses listed within the City of Cockburn Town Planning Scheme No.3 are prohibited.		X	X	X

Use Class	Zones		
	Mixed Use – Residential, Retail and Commercial	Mixed Use – Residential/Commercial	Mixed Use – Retail/Commercial
USES NOT LISTED			
Uses not listed In accordance with clause 4.4.2 of the Scheme.			

Note 1 – Grouped dwellings are restricted to a maximum of 30% of the developable land area within any parcel of land as identified on the Structure Plan.

5.3 Specific Development Requirements

To guide land use and development, Design Guidelines (to inform the adoption of detailed area plans pursuant to Clause 6.2.15 of the Scheme) are required to be prepared and approved by the local government for the Structure Plan Area.

The principles to be used to guide the preparation of the Design Guidelines are outlined in Clause 6.5 of Part One of the Structure Plan Report.

The Design Guidelines and principles set out in Clause 6.5 are informed by the following:

a. A maximum residential density does not apply to the Structure Plan Area.

b. Residential density codes have not been allocated and will not apply to the Structure Plan Area. Accordingly, Clauses 5.2, 5.4 and 5.8 of the Scheme do not apply to the Structure Plan Area.

c. The maximum building height will be guided by limitations imposed by the Jandakot Airport flight path contours.

d. Minimum residential building height will be three storeys across the Structure Plan Area. In some locations (where land is zoned Mixed Use (Residential, Retail and Commercial)), building height may be reduced to two storeys to allow for attached grouped dwellings, provided the extent of grouped dwellings does not exceed 30% of the developable land area within any parcel of land as identified on the Structure Plan.

   In the above regard, lower building heights will need to be counterbalanced by higher buildings in other locations.

e. Where possible, active retail and commercial land uses are to be located at ground and/or upper levels in locations shown on the Structure Plan Map.

f. Retail development is to be integrated with mixed use (residential and commercial) development.

g. Provision of parking is to be in accordance with the following car parking rates guide set out in Table 3. Where justified, this may be varied by Council in accordance with Clause 5.6 of the Scheme.

Table 3. Cockburn Central West Car Parking Rates

Use Class	Minimum Number of Car Parking Bays
Residential Dwelling	0 per dwelling unit, with a maximum of 2 bays per dwelling: 1 car bay for three (or more) bedroom dwellings with a maximum of 2 bays per dwelling. Visitor car parking is to be a minimum of 10% of the total residential car parking requirement and be provided in addition to the required residential car parking. On-street parking located adjacent to the frontage of a lot can be allocated towards visitor parking.
Retail (where the built form does not facilitate an easy transition to "Office" uses)	4 bays per 100m² GFA
Office (where the built form does not facilitate an easy transition to "Retail" uses)	2.5 bays per 100m² GFA
Mixed Use (where the built form facilitates alternative opportunities to "Office" and "Retail" uses)	3 bays per 100m² GFA

5.4 Residential

5.4.1 Dwelling Target

The objective is to provide for approximately 1000 dwellings within the Structure Plan Area. Therefore the residential density target per gross hectare is approximately 30 dwellings.

6 Development

6.1 Residential Density

The built form and residential density within the whole Structure Plan Area will be determined through Design Guidelines (Detailed Area Plan). The Design Guidelines will be used to guide development in lieu of the WAPC Residential Design Codes.

6.2 Detailed Area Plan

Pursuant to Clause 6.2.15 of the Scheme, the Design Guidelines will be prepared and approved as a Detailed Area Plan.

6.3 Timing of Development

Planning approval will not be considered in the absence of a Detailed Area Plan (Design Guidelines) approved by the City of Cockburn pursuant to Clause 6.2.15 of the Scheme, unless it is for bulk earthworks (prior to any building construction) or the City is satisfied that the proposed development is of a scale and permanence that would not undermine the:

a. design of the Detailed Area Plan (Design Guidelines);

b. development of the surrounding area in accordance with the Structure Plan; and/or

c. timely provision of infrastructure and services to the area, including public utilities and roads.

6.4 Access

No individual lots or development created within the Structure Plan Area will have direct access to North Lake Road, Poletti Drive, Beeliar Drive or Midgegooroo Avenue.

6.5 Principles for the Design Guidelines

The following principles will guide the preparation of the Design Guidelines for the Structure Plan Area:

6.5.1 Built Form

a. Massing Compatibility

- All residential, commercial and retail development and the Integrated Community Facility should complement and be compatible with adjoining built form.

b. Pedestrian Scale

- Buildings should be designed to create a comfortable interface for pedestrians using streets and public spaces. This would include maximum heights along street boundaries and sufficient visual interest and activity at ground level.

c. Height and Setbacks

- Building heights should be coordinated to allow adequate solar penetration to adjacent sites and create a cohesive urban form.
- Where appropriate, tall buildings should be encouraged to take advantage of the proximity to the Cockburn Rail Station.
- Setbacks should be appropriate to the intended land use, but should also cater to changes in use over time.
- Setbacks should be designed to encourage interaction in the semi-public setback zone.

d. Fine Grain Development

- Development standards must ensure that buildings are broken up into smaller increments to encourage architectural variety and a 'fine grain' streetscape texture. Large monolithic buildings that take up long stretches of a street are to be avoided.

e. Materials and Articulation

- All design will be encouraged to use high quality design, details, material and finishes.
- All buildings will have a high level of articulation, achieved with inset doors, windows, balconies, bays, and architectural features such as blades and shade structures.
- Building facades should layer high-quality materials of various texture to promote depth and visual interest.
- Service/power infrastructure including transformers and switchgear should be placed in less obvious locations away from corners and places of exposure with a preference for laneways and incorporated into built form structures.

f. Landmark Sites / Corners

- Certain sites within the Structure Plan Area are particularly visible, terminating view lines or forming important corners. These sites will require careful study to ensure that they respond appropriately to the context and architecturally express the importance of the particular location.

g. Utility Corridor Interface

- Developments should endeavour to minimise the negative visual impacts of the utility corridor. Where possible, buildings should block key views of the electrical towers and adjacent development should be designed to 'front' away from the corridor.

h. Privacy

- Development standards should be created to ensure a sufficient level of privacy for ground-level outdoor living areas in residential development. This should be balanced by an acknowledgement that in a dense mixed-use environment, privacy protection is necessarily less than in a single residential lot area.

i. Signage

- Signage should not dominate the public realm or the built form and should be of high quality and integrated into the building design. Minimise excessive signage along window frontages.

j. Climate Response

- To reduce energy consumption due to heating and cooling, buildings should be designed using passive solar principles. This includes achieving significant glazing on northern facades and minimising glazing on the other facades.
- North facing glazing should be protected by appropriately designed horizontal shading.
- Any glazing on east and west facades should use vertical shading devices to reduce heating loads.
- Buildings envelopes should contain significant amounts of insulation to slow thermal transfer through walls.
- Building interiors should include sufficient thermal mass to act as a 'heat sink,' holding heat in winter and delaying the temperature peak in summer.
- Buildings should be designed with operable windows in appropriate locations to facilitate cross ventilation.
- Buildings should specify efficient appliances to minimise ongoing energy consumption.

- Buildings should investigate opportunities to supplement their power supply via localized sources such as PV panels, small scale wind turbines, geo-thermal and tri-generation systems.

k. Land Use

i. Variety / Mix

- Provide for a range and variety of residential, retail and commercial development.
- The retail and commercial opportunities should be clustered in appropriate locations and design to best facilitate their commercial success in a pedestrian-oriented environment.
- The development mix will include a range of medium to high density housing typologies including townhouses, terraces, maisonettes, shop-top apartments, walk-up apartments, and lifted high-rise apartments.
- The location of grouped dwellings (townhouses and terraces) will be identified in accordance with note 1 under the Zoning Table in Clause 5.2 and Clause 5.3 d.
- The project should allow for a range of residential dwelling types and sizes to cater for singles, young couples, families, senior and others and for different income levels.

ii. Ground and Upper Floor Activation

- Commercial and retail land uses are to be located at the ground and possibly upper levels (commercial uses at the upper levels) and clustered as shown on the Structure Plan Map.
- Where there are active land uses, create strong visual connections between internal areas of building and the external public realm in these locations to create interest at the pedestrian level and promote community interaction.
- Where there are active ground floor uses, the floor levels are to correspond with the adjacent footpath or slow speed mixed traffic zone to provide direct pedestrian access.
- No extensive blank walls, parking, garage doors or service areas are to be located along streets or open spaces. Such areas should be accessed from laneways or be internalised in development blocks.

iii. Provision of Car Parking

- Car parking provision within developments should be sufficient to cater for the anticipated demand. However, given the proximity to the Cockburn Rail Station, all attempts should be made to reduce this demand where possible through initiatives such as car sharing programs, provision of scooter/motorcycle bays, providing end of trip facilities for cyclists and investigating opportunities for shared parking between land uses with different peak demand times.

6.5.2 Open Space

a. Character

- All open space should be designed to create a strong local character based on its size, intended use, and character of adjacent development and land uses.

b. Variety in Size and Use

- Open spaces should fit into a clear hierarchy that provides for a range of uses and users.

c. Natural Surveillance

- Maximise passive surveillance of the public realm through appropriately designed buildings that address the public spaces through windows, major openings and balconies.
- Local streets and laneways should form a portion of the perimeter of all open spaces.

d. Spatial Enclosure

- Buildings should be used to define the edges of open spaces to create positive and consistent spatial enclosure.

e. Activation

- Open spaces should be designed to encourage a variety of activities to occur within them. Designs that facilitate multiple uses among various user groups are encouraged.

f. Roof Gardens

- Using roof spaces as roof terraces or gardens, where appropriate, is strongly encouraged.

g. Sporting Theme

- Given the significant investment in the community recreational/sporting facility, the open space system should build on this theme by incorporating various opportunities for the community to engage in sporting activity.

h. Public Art

- Public art is encouraged at appropriate locations to signify important destinations or vistas, and to make reference to relevant site-related ecological or cultural themes.

i. Water-Sensitive Urban Design

- The open space system has been designed to assist with the management of stormwater on site. Open spaces should not simply meet the technical requirements of this objective; rather they should find creative ways to express this function in the detailed design.

6.5.3 Streets and Pathways

a. Town Centre Connection

- Continue the high order pedestrian link from the Cockburn Central Rail Station via Junction Boulevard and Signal Terrace to the Integrated Facility.

b. Intersections

- Intersections should be carefully designed and detailed to ensure slow traffic speeds and a strong pedestrian orientation. This can be achieved with such design elements as changes in paving materials, narrow driving lanes, clear signage, minimal corner truncations, and small radius kerbs at corners.

c. Regional Pedestrian Linkages

- Pedestrian and cycle linkages should be retained and strengthened to ensure easy access to and through the locality.

d. Car Parking

- Minimise the visual impact of car parking along streets and open space with screening, landscaping or innovative design. The provision of concealed parking behind buildings or underground is encouraged.
- Limit the amount of parking to encourage the use of public transport, although the Integrated Community Facility will require sufficient car parking to service this land use.
- Maximise on-street car parking within the road network.
- Maximise land productivity by providing for car parking within the Western Power easement in accordance with Western Power approved design plans.

e. Pedestrian Access to Buildings

- All buildings should have at least one pedestrian access directly from the adjacent street.
- Laneways to rear car parking should be provided at regular intervals to break up buildings and facilitate access and permeability.

f. Shared Streets

- Standards should be developed to ensure that shared streets (slow speed mixed traffic zone) function optimally, balancing the needs and rights of all modes of transportation.

g. Noise Assessments

- Provide general guidance on the requirements for the preparation of noise assessment (acoustic) reports and identify those lots along North Lake Road, Beeliar Drive and Midgegooroo Avenue where such assessments would be required to be lodged as part of the application for planning approval for residential development.

7 Conditions of Subdivision/Development Approval

7.1 Developer Contributions

In accordance with the requirements of Clause 6.2.6.1(f)(x) of the City of Cockburn's Town Planning Scheme No.3, the developer shall contribute to the proportional upgrading of the following infrastructure items:

1. The cost to upgrade the Signal Terrace and Midgegooroo Avenue intersection to become a traffic light controlled intersection. This includes:
    i. Land;
    ii. Preliminaries and detailed design;
    iii. Full earthworks and service relocations where required;
    iv. Pedestrian paths and infrastructure to provide for safe crossing of the intersection under lights;
    v. Stormwater management;
    vi. Lighting;
    vii. Landscaping.
2. Land which exists under the Structure Plan Area which is required for the Poletti Road upgrades designated under 3 below.
3. The cost to upgrade Poletti Road including all intersections. This includes:
    i. Preliminaries and detailed design;
    ii. Full earthworks and service relocations where required;
    iii. A road which comprises a divided carriageway with a 3.5m carriage in each; a 6m wide central median to provide for dedicated right hand turning lanes (may be flared in and out along the stretch of road); 1.5m beside carriage cycle lanes; a 2.5m shared path within the eastern verge only; .
    iv. Traffic and pedestrian controlled intersections at the northern and southern ends;
    v. Stormwater management;
    vi. Lighting;
    vii. Landscaping.

7.2 Other

7.2.1 Noise Assessment

Noise assessment (acoustic) reports will be required to be submitted as part of any application for planning approval for residential development on lots abutting North Lake Road, Beeliar Drive and Midgegooroo Avenue as identified in the Design Guidelines.

The determining authority shall impose on the grant of planning approval for residential development a requirement for a notification to be placed on the Certificate(s) of Title(s) of affected lots containing residential development to advise of construction standards to achieve quiet housing design in accordance with *State Planning Policy 5.4 Road and Rail T ransportation Noise and F reight Consideration in Land Use Planning* (as amended) and with the above noise assessment (acoustic) reports.

7.2.2 Bushfire Construction Standards

This Structure Plan is supported by the *Cockburn Central West Fire Hazard Assessment* prepared by Town Planning Management Engineering Pty Ltd (June 2014). Regardless of whether the land has been formally designated as bushfire prone, any buildings to be erected on land identified as falling within 100 metres of a bushfire hazard is designated as bushfire prone land and shall comply with the requirements of Australian Standard 3959 under the *Building Code of Australia*.



COCKBURN CENTRAL WEST STRUCTURE PLAN - PLAN 1

COCKBURN CENTRAL WEST

LANDCORP

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plan:	11/055/031A
date:	19/08/2016
scale:	1:2,500
designed:	MB
checked:	MB
drawn:	MH

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DRAFT COCKBURN CENTRAL WEST STRUCTURE PLAN



PART TWO

EXPLANATORY SECTION

1 Planning Background

1.1 Introduction and Purpose

The following section outlines the statutory and strategic planning framework (within the regional and local context) relevant to CCW (also referred to as the Structure Plan Area or the site) and also provides a description of the location, land ownership and current land use for the Structure Plan Area.

The CCW Structure Plan will provide the planning framework that will guide the future subdivision and development of the site. In particular, it will guide the layout of the subdivision and appropriate land uses. It will also guide other aspects relevant to the development of the site such as servicing, water management and transport planning.

1.2 Land Description

1.2.1 Location

Cockburn Central West is situated between Beeliar Drive and North Lake Road, immediately to the west of the Cockburn Central Town Centre. It is specifically bounded by North Lake Road to the north, Midgegooroo Avenue to the east, Beeliar Drive to the south and Poletti Road to the west (refer to **Figure 1**).

CCW forms part of the Cockburn Central Regional Centre and is surrounded by residential development to the south and residential and industrial development to the west. The Muriel Court Structure Plan Area is located immediately to the north of CCW, which currently consists of rural residential development but will be developed as high density residential/mixed use in the future, in accordance with the endorsed of the Muriel Court Structure Plan. The Cockburn Central Town Centre is located to the east and is currently in the process of being developed (Stage 2). The Gateways Shopping Centre precinct is located to the south-east of CCW.

The site is highly accessible, both by public transport (specifically via the bus station and the Cockburn Central Rail Station) and by the regional road network including Beeliar Drive and North Lake Road with the former road providing direct access links to the Kwinana Freeway. The current North Lake Road is in the process of being realigned to run in an east-west direction (north of CCW) with a proposed connection to the Kwinana Freeway and Midgegooroo Avenue to the east of the site is in the process of being realigned and upgraded.

1.2.2 Area and Land Use

The CCW Structure Plan Area comprises 32.5ha. It is currently vacant of any built structures and comprises remnant vegetation of varying quality.

1.2.3 Legal Description and Ownership

CCW comprises seven lots plus a section of road to be closed (originally North Lake Road), which can legally be described as follows (refer to **Figure 2**). The certificates of titles for the lots within the site are contained in **Appendix A**.

Table 1. Legal Description and Ownership

Lot No.	Land Ownership	Certificate of Title (Volume / Folio)	Area (hectares)	Easements / Encumbrances
1	Western Australian Planning Commission	1766 / 285	1.6902	None
53	Western Australian Planning Commission	565 / 150A	1.5237	None
54	Western Australian Planning Commission	1398 / 114	3.8228	A Restrictive Covenant applies (H942350)
55	Western Australian Planning Commission	2712 / 677	0.6106	Easement Burden for Right of Carriageway Purposes (See Diagram 13057)
804	Western Australian Planning Commission	2227 / 42	1.4581	Easement to the State Energy Commission of WA (See Deposited Plan 35222)
1001	City of Cockburn	1972 / 6	0.2524	Easement to the State Energy Commission of WA (See Instrument D807344)
9504	Western Australian Planning Commission	2704 / 963	21.419	None
Road to be closed (originally North Lake Road)			1.7554	

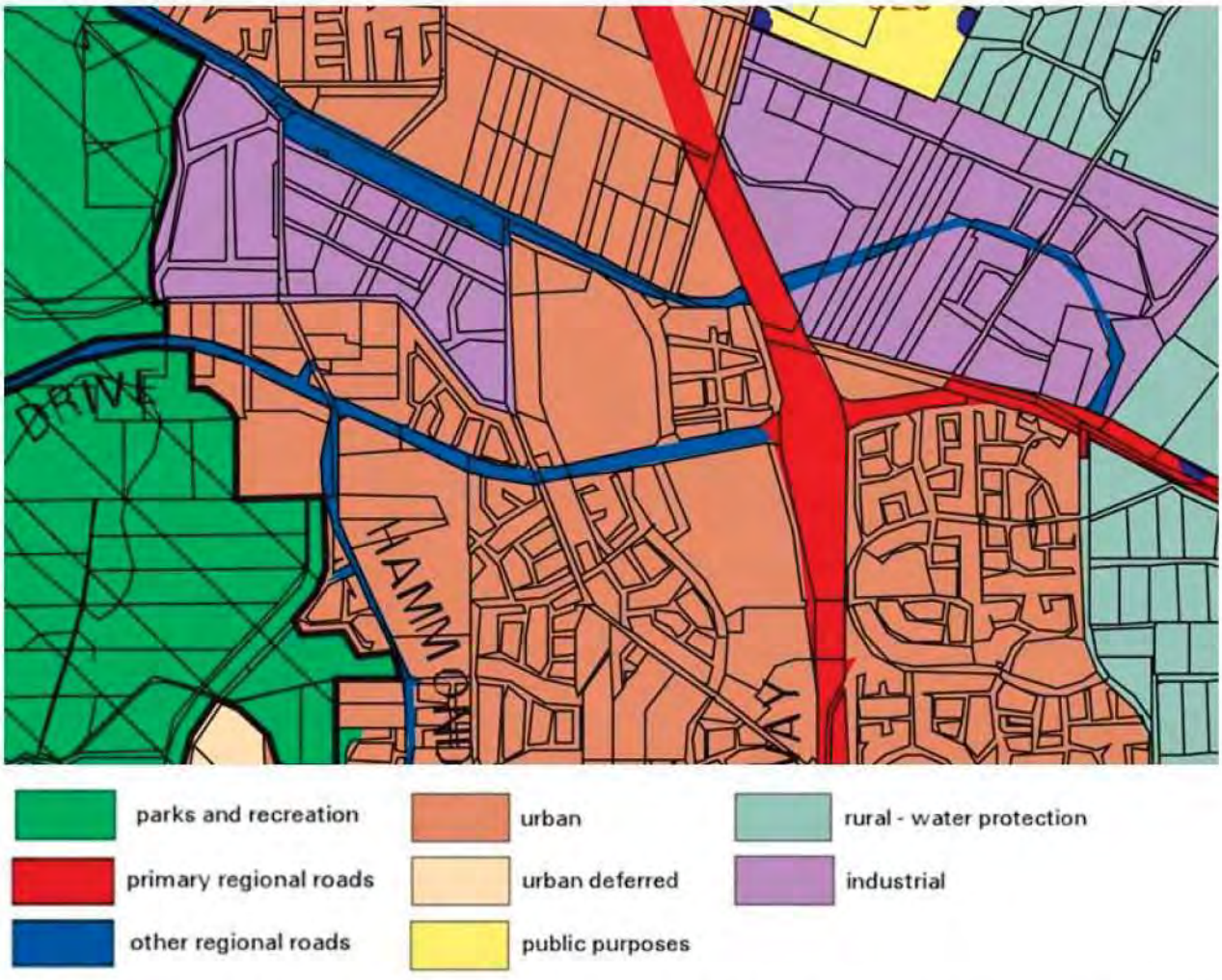
1.3 Planning Framework

1.3.1 Zoning and Reservations

1.3.1.1 Metropolitan Region Scheme

All landholdings within CCW are zoned 'Urban' under the Metropolitan Region Scheme (MRS), confirming that the area is suitable for urban development, subject to appropriate structure planning and subdivision design.

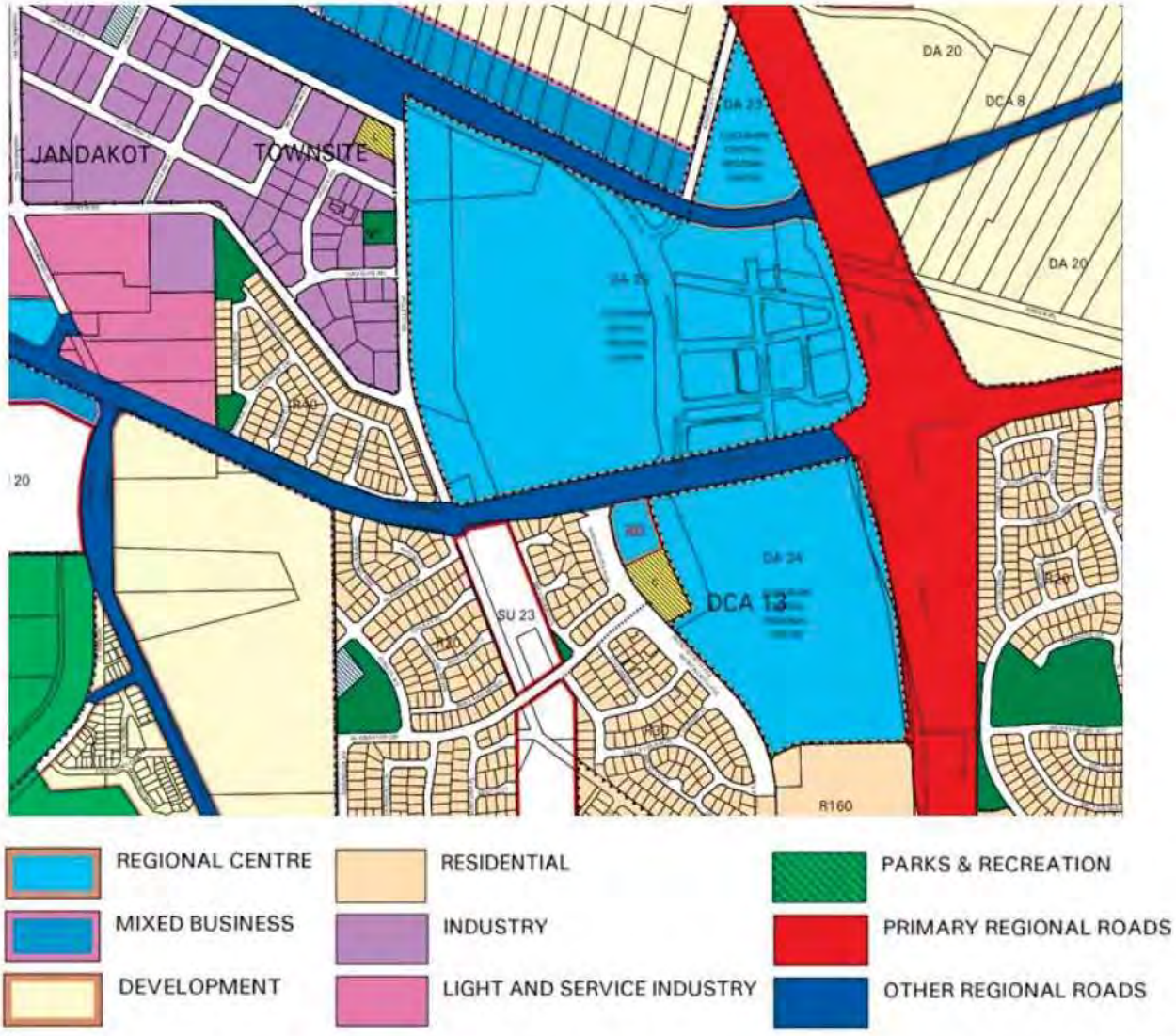
The 'Urban' zoning confirms the State Government's intention that urban development proceed in a timely manner within CCW. The extract of the MRS Map below illustrates the MRS zonings associated with the site and its surrounds. Land to the west is zoned 'Industrial' and compatibility with residential development within the site is considered in Section 1.3.1.2 of this report.



North Lake Road and Beeliar Drive which border CCW to the north and south, respectively, are both reserved as 'Other Regional Roads'. Land to the north, south-west east and south of CCW is zoned 'Urban'. Therefore proposed urban development within the Structure Plan Area will be complementary with adjacent land uses and zones.

1.3.1.2 City of Cockburn Town Planning Scheme No. 3

CCW is zoned 'Regional Centre' under City of Cockburn Town Planning Scheme No. 3 (TPS 3), and is also identified as 'Development Area 23 – Cockburn Central (Town Centre Precinct)' within the Scheme. An extract of the relevant Scheme Map is reproduced below.



Special provisions apply to control development in this Development Area under Schedule 11 of the Scheme. In summary, these provisions (which also apply to Cockburn Central Town Centre) include the following:

1. Subdivision and development being undertaken in accordance with this Structure Plan.
2. To facilitate the development of a multifunctional Town Centre which shall include a range of intensive residential and commercial development, shopping, entertainment, regional sport, bushland/wetland area and cultural facilities supported by a highly interconnected transport system. There are also restrictions on supermarket uses within the Town Centre.
3. Notwithstanding any other provisions of the Scheme, where land use permissibility is stipulated within the Structure Plan, that permissibility shall apply.
4. To provide public transport and strong pedestrian connections between the Cockburn Central Railway Station, the Town Centre and the Gateways.
5. Residential density should be R160 unless otherwise provided for by an approved Structure Plan or Detailed Area Plan.

6. Development is required to be in accordance with a Detailed Area Plan and any Design Guidelines that are prepared for the site in addition to any other requirement in the approved Structure Plan and in the Scheme.

7. Car parking shall be provided at a rate and in such a location as specified by the approved Structure Plan.

The adjacent Town Centre to the east, as well as the Gateways precinct to the south-east of the Structure Plan Area are also zoned Regional Centre under the Scheme. Residential land uses are located to the south and partially to the west.

The Scheme provides no specific guidance for land uses on the site, instead the permissibility of land uses will be guided by the Structure Plan as per provision 3 (above).

Council officers advise that in accordance with provision 6, Design Guidelines for the site will be prepared and adopted as a Detailed Area Plan. Therefore the preparation and adoption of the Design Guidelines will be carried out in accordance with Clause 6.2.15 of the Scheme (TPS3).

Land to the west of the site is mainly zoned Industry under TPS3. Based on land use data provided by Council, there are a variety of existing light, service and some general industrial uses, including boat and yacht sales and services, motor vehicle repairs, steel fabrication, farm supply centre, transport depot and storage yard, and marine engineering and fabrication.

The location of steel fabrication works within the industrial area has been considered by RPS Environmental. The EPA guidelines suggest a nominal 500m - 1000m as a separation distance, however these distances are applied to heavy industry with potentially noxious uses generating noise and air pollution. With respect to the nearby light industrial area, there are some light fabrication workshops present and the majority of work is usually done within an enclosed space with limited to no heavy transport or heavy yard movements taking place.

The development proposes medium to high density mixed use along the western portion of the site and is approximately 110m away from these workshops. The proposed Structure Plan provides a greater separation distance than the current residential development located to the west, which immediately abuts, and in some cases, directly faces the south-western boundary of the light industrial precinct along Cooper Road. Furthermore, due to the nature of development proposed by the Structure Plan, there may be the opportunity to ameliorate any potential noise issues through the design of built form. This is not considered to be an issue that would adversely affect the Structure Plan and all industrial uses are required to comply with relevant state regulations and guidance that control noise and air pollution.

1.3.2 Regional and Sub-Regional Structure Plan

The CCW Structure Plan is preceded by the Draft Thomsons Lake Draft Regional Centre Master Plan, which is reflected on the City of Cockburn's Cockburn Regional Centre Composite Structure Plan (refer to **Appendix B**). This Composite Structure Plan was not advertised or approved by the City of Cockburn as the purpose of the plan was to link together all the various structure plans in the area.

Under previous Structure Plans, CCW was intended to be an environmental and recreational precinct, however the current Structure Plan for the site has been prepared in accordance with the Urban zoning of the land.

Notwithstanding this, the CCW Structure Plan retains much of the regional recreational function as initially proposed for the site, however urban (mixed use) development is also incorporated. There is also more focus on providing integrated and active recreational opportunities, which will provide a direct benefit to the existing and future community.

1.3.3 Cockburn Central Town Centre Structure Plan

A Structure Plan was prepared and endorsed for the existing Cockburn Central Town Centre. All existing development has been undertaken in accordance with the Structure Plan. The Structure Plan is divided into four precincts; Park Precinct, Beeliar Drive Precinct, Central Precinct and Town Square Precinct. The Structure Plan does not include the two PTA carpark sites. Each precinct has different features, however

essentially the Structure Plan provides for medium to high density mixed use development. The Structure Plan also includes a land use permissibility table (Zoning Table) to guide appropriate development.

Following the endorsement of the Town Centre Structure Plan, Design Guidelines were prepared to further guide development within the Town Centre. It is intended that the CCW Structure Plan will be an extension of the Town Centre Structure Plan and there will be a strong degree of integration, particularly in terms of built form, land use and pedestrian linkages.

1.3.4 Directions 2031 and Beyond – Metropolitan Planning Beyond the Horizon

The WAPC released *Directions 2031 and Beyond – Metropolitan Planning beyond the Horizon* in 2010. The purpose of this framework is to establish a vision for the future growth of the Perth and Peel Regions and provide a framework to guide detailed planning and the delivery of housing, infrastructure and services to accommodate that growth. The Strategy builds on many of the principles of Network City in terms of achieving a reduced overall need for travel, a more energy efficient urban form and increased use of public transport, cycling and walking for access to employment and services. The Strategy is based on three integrated networks comprising:

> An activity centres network: network and hierarchy of centres that provides for the distribution of activity centres and jobs throughout Perth;

> A movement network: an integrated system of public and private transport networks designed to support and reinforce the activity centres network; and

> An environmental network: a network of parks, reserves and conservation areas that support biodiversity, preserve natural amenity and protect natural value of resources.

Directions 2031 identifies Cockburn Central as a secondary centre as part of the hierarchy of activity centres within the Perth and Peel Regions. The Strategy states that the role and function of activity centres, and the diversity of activities within them will vary depending on their catchment, although they generally will:

> Provide services, employment and activities that are appropriate for and accessible to the communities they support;

> Be integrated with and encourage the efficient operation of the transport network, with particular emphasis on promoting public transport, walking and cycling and reducing the number and length of trips;

> Be designed based on transit oriented development principles;

> Provide opportunities as places to live through higher density housing and the development of social and cultural networks;

> Encourage the agglomeration of economic activity and cultivation of business synergies; and

> Support the development of local identity and sense of place.

More specifically, secondary centres are recognised as important suburban centres which offer a mix of goods and services and typically include office, housing, community, recreational and in some cases entertainment uses. Directions 2031 identifies that opportunities exist to encourage more mixed use development in appropriately located secondary centres, especially those located along high frequency public transport routes. CCW is an example of such an opportunity, with the Structure Plan seeking to provide a complementary mix of land uses, which are suited to the community and will support the utilisation of the Cockburn Central bus and train station.

1.3.5 State Planning Policy 4.2 – Activity Centres for Perth and Peel

State Planning Policy 4.2 (SPP 4.2) specifies broad planning requirements for the planning and development of activity centres. It is mainly concerned with the distribution, function and broad land use and urban design criteria of activity centres and with coordinating their land use and infrastructure planning.

Cockburn Central, which includes CCW, is identified as a secondary centre under SPP 4.2.

The relevant objectives of the SPP 4.2 and how these are met through the Structure Plan are detailed below:

- *Plan activity centres to support a wide range of retail and commercial premises and promote a competitive retail and commercial market.* Whilst CCW provides for commercial and retail development to promote activity and vibrancy at the ground level and where appropriate upper levels, the Structure Plan will not detract from the established Cockburn Central Town Centre or the Gateways Precinct.
- *Increase the range of employment in activity centres and contribute to achievement of sub-regional employment self-sufficiency targets.* The proposed inclusion of the regional sporting facilities, the aquatic centre, commercial/office uses, some retail uses within CCW will provide additional employment opportunities within Cockburn Central. This is further addressed in Section 1.3.9 of the report.
- *Increase the density and diversity of housing in and around activity centres to improve land efficiency, housing variety and support centre facilities.* A variety of medium to high density multiple dwellings is proposed including mixed use apartments, two storey terraces (in certain locations), multiple storey apartment towers, three storey walk-up apartments, maisonette apartments, multiple storeyed podium apartments.
- *Ensure activity centres provide sufficient development intensity and land use mix to support high-frequency public transport.* The Structure Plan proposes a variety of land uses and medium to high residential densities through mixed use development, which will support the existing bus services for CCW and the existing rail services within the Cockburn Central Town Centre.
- *Maximise access to activity centres by walking, cycling and public transport while reducing private car trips.* The proposed Integrated Facility is considered to be a land use that will primarily be accessed by private car. However, strong connections are proposed across Midgegooroo Avenue which will encourage travel to Cockburn Central Town Centre and use of public transport. Numerous pedestrian links are shown within the Structure Plan and external linkages are also identified.
- *Plan activity centre development around a legible street network and quality public spaces.* The Structure Plan provides for a street network which links directly to the Cockburn Central Town Centre. A legible road system is proposed that links to the existing external road system (east and west primarily) and provides connectivity within the site. The public spaces will encourage the use of the active and passive recreational facilities provided for within the Structure Plan Area.
- *Concentrate activities, particularly those that generate a high number of trips, within activity centres.* The key land use that the Structure Plan is based around (ie. Integrated Community Facility - regional sporting facilities and the aquatic centre) will encourage a high number of trips and forms the central focus for the site.

SPP 4.2 also outlines numerous policy provisions to meet the above objectives. The critical policy provisions for the CCW Structure Plan and how they are achieved are outlined below:

- *Diversity and intensity of land uses* – The proposed Mixed Use Zones and the Public Purposes - Community Reserve promotes variety and a co-location of land uses such as commercial, educational, retail, residential and recreational. A range of land uses within CCW will ensure a generation of activity outside normal business hours. Intensity and diversity of land uses within the site and setting appropriate targets is further dealt with in Section 1.3.9 of the report.
- *Employment self-sufficiency targets*- This is important for activity centres and this issue is dealt with in Section 1.3.9.3 of the report.
- *Location of major offices in secondary centres* – This use is strongly encouraged in the CCW site. The site is considered to be highly attractive for office development given its proximity to a major road network including the freeway and to public transport. Offices are also a suitable use for location along busy roads such as Beeliar Drive and North Lake Road and do not require high level access. It is also a use that is compatible with residential development and brings people into an area during the day when residents may be absent. It also generates spin-off type uses such as cafes, lunch bars and local shops.
- *Prioritising public transport* – This is a key focus of the Structure Plan and as such strong pedestrian connections are proposed to the Cockburn Central train station and bus interchange. This issue is further dealt with in the GHD Transport Assessment (refer to **Appendix E**).

> *Provision of a network of street and public spaces as principal elements* – The Structure Plan is focussed around public open spaces in the form of the primary AFL oval (located within the Public Purposes – Community Reserve), the wetland and drainage area and the playing fields.

According to SPP 4.2, activity centre structure plans are required to be prepared for secondary centres, hence the lodgement of the CCW Activity Centre Structure Plan. SPP 4.2 includes the Model Centre Framework, which outlines the issues or content that are required to be addressed in activity centre structure plans, including local and regional context movement, activity and urban form. Where relevant to the site, the contents are addressed throughout this report and the technical studies in the following manner:

> The urban form is dealt with through the indicative building layout plan (refer to **Figure 13**) demonstrating the close relationship between the Structure Plan design and the future built form. The plan also demonstrates how buildings would address the streets and public open spaces. The future built form is further considered in the principles for the future Design Guidelines (refer to Part One of the Structure Plan report).

> The various forms of movement (i.e. pedestrian, cars, cycling and public transport) are addressed in detail in the GHD Transport Assessment and Section 3.5 of this report. In particular the report outlines all the surrounding neighbouring attractors that require strong linkages (i.e. footpaths, share pedestrian cycling paths and slow speed mixed traffic zone) to and from the site. The Transport Assessment also addresses pedestrian connections to the Gateway Shopping Centre via the two Beeliar Drive signalised crossings (refer to **Appendix E**).

> The environmental values and characteristics of the site are dealt with in Section 2 and the RPS Flora and Fauna Report in **Appendix C**.

> Active retail land uses are encouraged at the ground floor level adjacent to Midgegooroo Avenue and the slow speed mixed traffic zone, leading to more pedestrians. A pedestrian plan outlining different routes between attractions is included in the GHD Transport Assessment.

> Targets for legibility and accessibility for the site are addressed in Section 1.3.9 of the report.

> Car parking strategy for the site is provided in Section 3.6 of the report with the objective being to provide upper limits on parking. However, the Integrated Facility discussed in Section 3.2 requires substantial short term parking, which is proposed to be provided in the Western Power Easement.

> Targets for diversity and intensity of land uses within the site are dealt with in Section 1.3.9 of the report. Diversity of land uses within the CCW Structure Plan is promoted through the implementation of three Mixed Use Zones. In accordance with SPP 4.2 this will allow for both a vertical and horizontal mix of compatible uses and where possible encouraging active uses, particularly along the slow speed mixed traffic zone and Midgegooroo Avenue as identified on the Structure Plan.

> In terms of encouraging localised employment the Structure Plan promotes offices and retail development in the Mixed Use Zones.

> SPP 4.2 encourages a range of residential dwellings in order to address the housing needs of a diverse community and housing in upper storeys of mixed use developments are encouraged to maximise efficient use of land. The Structure Plan proposes a range of housing types such as town houses, terrace apartments as well as higher density apartments. Housing diversity throughout the site will also be addressed through the future design guidelines.

> Unlike most activity centres, retail land uses will not be the most dominant use on the site as this is largely catered for within the Gateway Shopping Centre Precinct, although there will be the opportunity for relatively small scale retail uses that compliment other uses on the site.

> In terms of resource conservation, a local water management strategy has been prepared for the site and identifies opportunities for water sensitive urban design (refer to **Appendix F**). Also, it is proposed to retain the natural topography of the site, where possible, and therefore minimise cut and fill over the site.

> The staging of the Structure Plan is outlined in the Servicing Strategy (refer to **Appendices G and J**).

1.3.6 Liveable Neighbourhoods

The CCW Structure Plan has been designed to directly address the most important elements of Liveable Neighbourhoods relevant to a medium to high density residential mixed use area. In particular, the Structure Plan addresses the following elements of Liveable Neighbourhoods which are elaborated on, as set out below:

> Element 1 – Community Design;

> Element 2 – Movement Network; and

> Element 7 – Activity Centres and Employment

1.3.6.1 Element 1 - Community Design

The following Liveable Neighbourhood requirements have been considered in terms of the CCW Structure Plan:

R8 - The street network should provide a high level of internal connectivity and good external linkages for local vehicle, pedestrian and bike movements, with traffic management to restrain vehicle speed, limit the negative impact of through traffic and create safe conditions for all street users. [p.23]

The local street network provides for a high level of internal access and connectivity for pedestrians, cyclists and vehicles via the wide local access roads, local roads, the shared pedestrian cycling path and the slow speed mixed traffic zone. The local street network also provides external connections, linking CCW with North Lake Road, Midegegooroo Avenue, Cockburn Central Town Centre and Poletti Road. A key feature of the local street network is the slow speed mixed traffic zone which encourages a safe user-friendly environment for pedestrians and cyclists. The mixed traffic zone promotes vehicular movement alongside pedestrian and cyclist movement in a low-speed environment.

R14 - District structure plans should provide for jobs by allocating land for around 60 percent of the jobs needed by a new population, (i.e. provide 0.8 jobs per person, based on a total requirement of 1.3 jobs per household). Local structure plans should provide for a relevant share of jobs, as derived from the district structure plan. [p.24]

The Structure Plan Area will provide for a localised increase in the number of employment opportunities, which are presently offered by the Cockburn Central Town Centre and the Gateways Precinct. This localised increase will contribute to the employment needs of the broader district area. This will be achieved by the development of some retail uses and also commercial/office uses within CCW. In addition, the Structure Plan makes provision for educational, community and recreational facilities within the Integrated Facility, which will also contribute towards increased employment opportunities.

R28 - Land identified with significant flood risk is to be protected from urban development. [p.28]

The low area of the site (central eastern portion of the site) will be utilised for drainage purposes and therefore development areas will not be subject to a flood risk.

1.3.6.2 Element 2 – Movement Network

The following Liveable Neighbourhood requirements have been considered in terms of the CCW Structure Plan:

The local street network should be highly interconnected with frequent junctions wherever possible with arterial routes to help limit travel distances and to promote walking, cycling, public transport usage and a strong sense of community. In centres, parallel streets should be provided one street block back from arterial routes to facilitate local access and to take the pressure off arterial intersections. These streets may be wide with extensive angled parking to serve the centre. They should be designed to make traffic behave appropriately by controlling the speed environment.

The primary pedestrian network is the street system, which is detailed to support pedestrian movement.

The Structure Plan promotes a walkable mixed use area through the development of a street network which is conducive to pedestrian and cyclist movement throughout the site, and to the Cockburn Central Town

Centre. The intent of the slow speed mixed traffic zone and the shared pedestrian cycling path is to create an environment, which is user-friendly for pedestrians and cyclists.

The Structure Plan provides for Midgegooroo Avenue to become a pedestrian-friendly trafficable environment, allowing pedestrians to more easily navigate and traverse between CCW and the Town Centre. The inclusion of Midgegooroo Avenue as a four lane, pedestrian friendly road will facilitate the integration of CCW with the Town Centre. There is no vehicular connection between the site and the Town Centre and as such pedestrian/cycling connections will be critical.

In the future Poletti Road will be upgraded with the intention that it will attract and convey a greater proportion of traffic between North Lake Road and Beeliar Drive than Midgegooroo Avenue.

A left in/left out vehicular connection is also proposed to link CCW with North lake Road, although no vehicular access is proposed to Beeliar Drive. However, a number of pedestrian links are proposed to both Beeliar Drive and North Lake Road.

Arterial routes will have signalised intersections, and these may be relatively closely spaced, especially in locations such as neighbourhood and town centres to provide pedestrian safety and convenience. Medians allow staged pedestrian crossing of the arterial routes.

There are numerous proposed and existing pedestrian signalised intersections which are discussed in the GHD Transport Assessment.

R7 - Streets should be designed to enable development to front all streets, including arterials, for most of their length.

The Structure Plan allows for development to front local roads and arterial roads (Beeliar Drive and North Lake Road) in accordance with R14 below.

R14 - A local street should be provided parallel to arterials particularly where they pass through town centres.

An indicative local road runs parallel to North Lake Road within the Structure Plan. Depending on the future form of development, a local road may also run parallel to Beeliar Drive.

1.3.6.3 Element 7 – Activity Centres and Employment

The following Liveable Neighbourhoods requirements have been considered in terms of the CCW Structure Plan:

R36: Centres should comprise a network of streets that encourage pedestrian activity, facilitate crossing of busy arterials, enable ease of local vehicle movement, provide extensive frontage for development, and define blocks that can accommodate mixed use development and off-street parking.

The internal road network design has enabled extensive frontage for the mixed use and Integrated Facility buildings and provides for areas of on-street parking. The most substantial off-street parking area will be provided within the Western Power Easement in the western portion of the site.

R47: Institutional uses should be designed in an efficient urban layout rather than in land-extensive campus style layouts. Buildings are to front streets, be multi-storey wherever practical, and parking is to be screened behind buildings.

The Integrated Facility will be a purpose-built facility for the City of Cockburn and will benefit from shared facilities with other organisations, including conference, training, indoor courts and other commercial facilities. The multi-storey Integrated Facility will front one of the key internal roads and the slow speed mixed traffic zone and is intended to be a landmark building which will contribute positively to the site's future streetscape. Parking for the Integrated Facility is proposed to be located in the Western Power Easement, although it is intended that the area will be screened with low lying landscaping as permitted by Western Power.

R49: Centres are to be located and designed to support public transport. In walkable catchments of rail stations or major bus stops, uses should be of sufficient density and diversity to generate passenger inward and outward movements. Larger centres should specifically establish uses that provide strong destinations for public transport users.

The Structure Plan proposes a variety of land uses and residential densities through mixed use development, which will support the existing and future bus services for CCW and the existing rail services within the Cockburn Central Town Centre. The land areas identified for Mixed Use purposes will enable the development of a wide variety of land uses including medium and high density residential, commercial, educational, retail and commercial. Further, the Integrated Facility will provide training, recreational and aquatic facilities. It is considered that the proposed land uses within CCW will provide a strong destination for public transport users, as well as pedestrians and cyclists.

R54: Centres should be provided with an appropriate range and distribution of public spaces, including urban squares, plazas, parks and other incidental public spaces.

An integral element of the CCW Structure Plan is the Integrated Facility, the wetland and drainage area, the playing fields and primary AFL oval, which provide for a variety of spaces for passive and active recreational pursuits.

1.3.7 City of Cockburn Local Planning Strategy

The City of Cockburn Local Planning Strategy was prepared to establish the long-term planning directions for the City and provide the rationale for the zones and other provisions of the Scheme. The Strategy was prepared prior to the adoption of the Scheme, more than ten years ago. The development of the Cockburn Central Town Centre has implemented the intentions of the Local Planning Strategy to provide for a future railway station adjacent to the Kwinana Freeway.

1.3.8 City of Cockburn Sport and Recreation Strategic Plan

The City of Cockburn's Sport and Recreation Strategic Plan (2009) provides an assessment and overview of the current sporting and recreational facilities within the City. The Strategic Plan identifies the future needs of the community through the development of a sport provision plan, to be implemented through a development plan for facilities.

The Strategic Plan identifies CCW as the site for an upgrade to the existing aquatic, fitness and court facilities located at South Lake Leisure Centre. As such, the Strategic Plan identified CCW as a District Reserve, which will comprise a recreation and aquatic centre alongside playing fields.

The CCW Structure Plan addresses the proposed recreational uses and facilities for the site and has incorporated these recommendations into the Structure Plan layout. Appropriate consultation has been undertaken with the City of Cockburn and other relevant stakeholders with a view to incorporating the proposed recreational uses and facilities in the most integrated and cohesive manner possible.

The recreation and aquatic centre is to be developed as an Integrated Facility, which will provide for a range of complementary land uses. The Integrated Facility is to be complemented by adjoining playing fields and AFL oval.

1.3.9 City of Cockburn Local Commercial and Activities Centres Strategy

The City of Cockburn Local Commercial and Activities Centres Strategy (LCACS) prepared by Pracsys for the City of Cockburn in 2012 provides a new strategic framework for the planning and implementation of activity centres within the City of Cockburn. The Strategy was prepared in response to the *Directions 2031 and beyond: Metropolitan Planning beyond the Horizon* and *State Planning Policy No. 4.2 – Activity Centres for Perth and Peel*. The outcomes sought by the LCACS are expressed as the following nine key principles:

> Promote the development of efficient, intense and compact centres;

> Support the optimization of the frequency, concentration and quality of transactions;

> Ensure continuing maturation of centres;

> Maintain and support the integrity of the activity centre network;

> Facilitate the optimization of access to and within centres;

> Improve the match between the use and purpose of centres;

> Encourage the creation of place identity, amenity and integrity;

> Promote place equity; and

> Ensure centres are developed in a coherent, logical and legible manner.

The Structure Plan proposes that CCW be developed as a seamless extension to the existing Town Centre and thereby supporting the secondary centre role of Cockburn Central. The Structure Plan acknowledges the key principles of the LCACS and proposes a variety of land uses and activities through mixed use development, which respond to the Strategy's key objectives.

The proposed land uses and diversity of activity within CCW is deemed appropriate and complementary to the purpose of the Town Centre and Cockburn Central as a cohesive activity centre. The proposed land uses and urban form within the Structure Plan area have been considered in terms of providing configurations of related activities in a compact manner in order to achieve land use efficiencies and synergies. Such principles are reflective of the LCACS and are embodied in elements of the Structure Plan such as the proposed Integrated Facility.

Given that CCW is envisaged as an area predominately for open space, recreational and mixed use purposes, the area will provide a variety of activities which will facilitate multiple purpose trips and contribute towards Cockburn Central as a secondary centre. The intended land use synergies will bolster activation of the area over more hours of the day. The proposed mix and intensity of land use will aid in forging CCW as an area of high amenity with a strong place identity. The future development of CCW will create a coherent, logical and legible place, which allows visitors and residents to easily navigate and traverse throughout the site and to other areas external to the site.

The following section outlines the relevant targets for CCW and the Town Centre in relation to the Local Commercial and Activities Centres Strategy's (LCACS) assessment areas for intensity, employment and diversity. Pracsys undertook this assessment for the site and Town Centre. Access, legibility and permeability of the Structure Plan are dealt with in the GHD Transport Assessment (refer to **Appendix F**) and Section 3.6 of the report. Targets have been established for these assessment areas where possible.

1.3.9.1 Intensity

In 2008 a poor level of intensity (a range of financial, social and employment transactions) present within the Cockburn Central Activity Centre was identified by the centre performance assessment, undertaken by Pracsys. An overall intensity score of 1 out of 10 was attributed to Cockburn Central based on 2008 data, which is below the minimum score of 3 and below the desired score of 3.5 for a Secondary Centre. However, it is acknowledged by Pracsys that there are shortcomings with the methodology used namely the non-consideration of local factors and comparison with other centres. Since 2008 the intensity of the centre has improved with further development of the Cockburn Central Town Centre. It is expected that CCW will provide for a range of financial, social and employment transactions to take place within the site, which will deliver an intense mix of activities, contributing to the improvement of the overall intensity of the Activity Centre as it matures.

The land use mix and development proposed by the CCW Structure Plan will provide for a range of activities which will contribute to the improved intensity of the Activity Centre. Within CCW, it is anticipated that the proposed Mixed Use zoned areas (ie. residential, retail and commercial uses) will account for approximately 30% of the total site area. As part of the Mixed Use zoned areas, residential uses will comprise approximately 70-80% of this area, with the remainder being retail and commercial uses. Additionally, CCW will provide sub-regional recreational, institutional and educational facilities as part of the Integrated Facility (2.6 hectares), which will account for approximately 8% of the total site area. These land uses will be well connected internally and also integrate with the adjoining Town Centre and the balance of the Activity Centre area.

This represents an improvement on the current intensity score for the overall Cockburn Central Activity Centre. According to Pracsys the intensity score will increase to 2 with the completion of Stage 2 of the Town Centre. By the completion of CCW the intensity of the Cockburn Central will be 2.83 based on projected dwellings targets. It is important to note that the target score for CCW has been heavily influenced by the substantial allocation of public open space throughout the Structure Plan Area, and also the Western Power easement and gas pipeline buffer, which account for approximately 8 hectares of the total site area.

1.3.9.2 Diversity

The Cockburn Central Activity Centre currently performs poorly in terms of its diversity (the degree to which a variety of activities are located within an Activity Centre – mixed of uses), as assessed in the centre performance assessment undertaken by Pracsys based on 2008 data. The current diversity score for Cockburn Central is 2.75 indicating that the centre was relatively homogenous, which is below the average score of 5.25 and below the best of type score for a Secondary Centre. Since 2008, the diversity of the centre has improved significantly with the development of the Cockburn Central Town Centre. The diversity score is expected to rise to 4.75 with the completion of Stage 2 of the Town Centre. Based on further assessment by Pracsys the diversity of the centre will rise to 5.75 when CCW is developed, which will be well above the current average of a Secondary Centre in the Perth Metropolitan Area. It is also expected by the Pracsys assessment that the centre will also exceed the mixed use target identified in SPP 4.2.

It is expected that CCW will provide a variety of land uses and activities which will contribute to the vibrancy, efficiency and resilience of the Activity Centre.

The zones proposed by the CCW Structure Plan are expected to promote a diverse mixture of land uses and activities. The permissible uses within the Mixed Use Zones, will encourage an extended period of use and attract a variety of users to the area. The proposed recreational uses associated with the integrated facility are expected to attract users at various times throughout the day and evening during the week and at weekends. The playing fields and wetland and drainage area will also draw a variety of users to the site and encourage interaction at various times of the day.

1.3.9.3 Employment

Based on 2008 data, Cockburn Central accommodated approximately 946 employment opportunities, which equates to an employment density of 40.86 jobs per hectare. Approximately 9% of the jobs were knowledge intensive or export orientated. This translates to an overall employment score of 1.75 which is below the average score of 2.75 and below the best type score for a Secondary Centre. However, since 2008 the employment within Cockburn Central has improved significantly. The employment is expected to rise to a score of 3.5 with the completion of Stage 2. By the completion of CCW the employment score for the centre will be 3.75 well above the current average of Secondary Centres in the Perth Metropolitan Area and will contribute significant to the employment self-sufficiency for the South-West Sub-region. It is expected that the development of an Integrated Regional Recreational Facility in CCW represents a significant opportunity for strategic employment creation.

1.3.10 City of Cockburn Local Planning Policies

The CCW Structure Plan takes into account a number of the City of Cockburn's Administration Planning and Development (APD) and Strategic Planning and Development Policies (SPD). The local policies relevant to CCW are addressed below.

1.3.10.1 APD 4 - Public Open Space

APD 4 specifies land features which will not be accepted by the City of Cockburn as part of the public open space requirement, and stipulates that all other public open space matters are to be consistent with Element 4 of Liveable Neighbourhoods. Such land features listed by the policy do not constitute the public open space provision for the Structure Plan and Element 4 of Liveable Neighbourhoods has been addressed in Section 3.4.

1.3.10.2 APD 31 – Detailed Area Plans

APD 31 supports the Scheme by elaborating on a number of matters which are to be considered in the preparation of a Detailed Area Plan. The matters contained within APD 31 will be appropriately considered in the preparation of the design guidelines, which are intended to guide future development within the site.

1.3.10.3 APD 62 – Vehicle Access Policy

APD 62 requires a Vehicle Access Policy Plan to be prepared by the City of Cockburn in consultation with relevant stakeholders, for instances where land adjacent to high traffic volume roads is developed for more intensive uses. A Vehicle Access Policy Plan provides a coordinated approach to vehicular access to ensure development maintains safe and efficient movement for vehicles, public transport users, pedestrians and cyclists.

A Vehicle Access Policy Plan is not relevant as no future lots within the Structure Plan will have direct access to the arterial road network. The Structure Plan is supported by a comprehensive Transport Assessment (refer to **Appendix F**).

1.3.10.4 SPD 9 – Waste Minimisation, Storage and Collection in Multiple Unit Developments

The policy details requirements pertaining to waste management and minimisation to be considered in the design, construction and function of larger residential and non-residential developments. SPD 9 provides that a Waste Management Plan (WMP) must be submitted in conjunction with the following types of Development Applications:

> Residential;

> Mixed Use Development; and

> Non-Residential Development.

Given that proposed development within CCW will comprise a mix of residential, mixed use and non-residential development, WMPs will be provided at the development stage, where the City of Cockburn deems it necessary.

2. Site Conditions and Environment

2.1 Environmental Assets and Constraints

Similar to the majority of land in the locality, the CCW site was historically cleared for agricultural purposes by 1965 (the exceptions being the nearby conservation reserves associated with the Beeliar Regional Park). Consequently the limited vegetation now present at the site is regrowth.

The shallow depression wetland feature (occurring over parts of 9504 Beeliar Drive and Lots 5 and 8) within the CCW site was originally excavated as part of land clearing in the late 1950's to provide summer grazing for dairy cattle. As a result of the historical clearing and agricultural land uses the native vegetation has been largely replaced by weeds. Since the 1960's the wetland's original extent has been dissected by the construction of North Lake Road and the subsequent construction of the Cockburn Central Town Centre development. However, some of the wetland's environmental attributes remain.

The key remaining environmental assets and constraints across the site are described below.

Table 2. Key Environmental Assets and Constraints

Environmental Assets	Environmental Constraints
Woodland – There are small areas of low open forest and woodland of Jarrah and Banksia trees (refer to the **Appendix C** Flora and Fauna Survey Report – Lots 1, 53 and 55 North Lake Road, Lot 54 Poletti Road and Lots 54, 804 and 9504 Beeliar Drive, Cockburn Central, RPS, 2011).	Dieback – The Flora and Fauna Survey Report (**Appendix C**) identified potential dieback occurrence on-site. This significantly compromises the long-term integrity of the remaining Banksia woodland community.
Wetland – The Resource Enhancement Wetland, although degraded in areas, provides a variety of habitat types. This wetland is not hydraulically dependant on the eastern wetland chain protected in the Beeliar Regional Park.	Grazing - The wetland has previously been excavated to provide summer cattle grazing. Weeds – There is extensive weed infestation throughout the wetland and upland habitats.
Biodiversity – There are areas of wetland, transitional and upland vegetation in various conditions that provide habitats on-site. The existing vegetation provides habitat for reptile and amphibian species, and provides limited habitat for highly mobile species such as common waterbirds (seasonally). However, similar (or better) habitat type is represented in the eastern wetland chain protected in the Beeliar Regional Park (for example North Lake, Bibra Lake, South Lake, Little Rush Lake, Yangebup Lake and Thomsons Lake).	Historical Land Use – Review of the historical aerial photographs shows that majority of the site was cleared by 1965 for agricultural use, including modification and excavation of the wetland for summer cattle grazing (refer to **Figures 4 to 7**).
Flora – No Threatened or Priority Ecological communities or Threatened Rare Flora were identified on-site. A Priority 4 species was identified and a Priority 1 Declared Weed was also recorded.	Isolation – Urban infill in this area has led to the separation and isolation of this regrowth habitat from reserves in the region.
Fauna – No Threatened Rare Fauna was identified on-site, 1 species of Conservation Significance (the Rainbow Bee Eater) was identified. The species is highly mobile and widespread across Australia.	Trespass – The site is subject to regular illegal use by off-road vehicles leading to further degradation of vegetation and weed and dieback spread.
Acid Sulfate Soils - Potential Acid Sulfate Soils have been mapped in the area	Acid Sulfate Soils –Excavation and/or dewatering associated with development of the land will require management.

A structure plan-environmental overlay plan has been prepared to show the environmental values together with the structure plan design (refer to **Figure 3**).

2.2 Topography, Geology and Soils

The site generally falls from approximately 40m AHD in the south-west to 23m AHD in the north east, which is approximately 2m below the adjacent Midgegooroo Avenue (**Figure 8**).

Swan Coastal Plain environmental geology mapping (Churchwood, 1978) across the site shows the geology as comprising:

Ms5 - SANDY SILT, dark brownish grey silt with disseminated fine grained quartz sand, firm variable clay content, of lacustrine origin.

S8 - SAND, very light grey at surface, yellow at depth, fine to medium grained, sub rounded quartz, moderately well sorted, of Aeolian origin.

S10 - SAND, relatively thin veneer over strong, blocky brown silts and clays.

Soil mapping for the site is shown in **Figure 8**. Bassendean sands allow rapid infiltration of water but are consequently highly leached with very poor nutrient binding capacity near the surface.

On this basis, the geology type and soils do not present an impediment to development, with the exception of the requirement for Acid Sulfate Soils management in the more low lying areas.

2.3 Vegetation Complex

The regional vegetation complex present on the site is the Bassendean Complex (Central and South), which is described as vegetation ranging from woodland of *Eucalyptus marginata – Casuarina fraseriana* – Banksia spp., to low woodland of Melaleuca spp. and sedgelands on the moister sides. This area includes the transition of *Eucalyptus marginata* to *Eucalyptus todtiana* in the vicinity of Perth (Heddle, 1980).

The reservation status of this vegetation type within the Swan Coastal Plain (SCP) at both a regional and local level is presented below. As can be seen from the below tables, this complex meets the state government target of at least 10% of the original extent proposed for protection (Bush Forever protection area of the Perth Metropolitan Region). On a regional basis, within a 5 km radius of the Cockburn Central site there are nine Bush Forever reserves. In particular, Bush Forever Site Nos. 390, 388, 263 and 391 contain large areas of mapped Bassendean Central and South vegetation complex. This demonstrates the extent of Bassendean Complex – Central and South secured for conservation and protection within the local region through Bush Forever and other secure reservation e.g. Beeliar Regional Park (refer to **Figure 9**).

Table 3. Regional Conservation Status of Bassendean Complex – Central and South (Perth Metropolitan Region of the SCP)

Description	Area	Percentage of Original Area
Original extent	46,220 ha	
Remaining area	10,919 ha	24%
Bassendean Complex – Central and South in existing protection	2818 ha	6%

Source: WAPC, 2000

As outlined above, this complex is locally well represented with a high percentage of the original extent remaining within the City of Cockburn, as outlined in Table 4.

Table 4. Local (City of Cockburn) Status of Bassendean Complex – Central and South

Description	Area	Percentage of Original Area
Original extent	6,850 ha	NA
Remaining area	2,680 ha	39%

Source: Del Marco et al. 2004.

The extent of the vegetation proposed for clearing (which is mostly in Degraded to Completely Degraded' condition) is approximately 30 ha or 0.14% of the present regional extent remaining of this vegetation complex.

The vegetation condition for over 71% of the site is mapped as 'Degraded to Completely Degraded'. The 'Degraded to Completely Degraded' area is inclusive of the wetland area.

2.4 Groundwater and Surface Water

2.4.1 Surface Drainage

The site is located on the northern boundary of the Coastal (North) Sub Catchment of the surface water catchment of the Peel Inlet – Harvey Estuary.

The site is also within the Water Corporation's Lake Yangebup Main Drainage catchment. This area has historically consisted of semi-rural/commercial lots which have existing shallow and informal drainage outfall systems to Lake Yangebup. There is an existing pipe and open drainage system along North Lake Road from Kentucky Court to Berrigan Drive that discharges into Lake Yangebup as part of the Jandakot – Arterial Drainage Scheme. These drains are relatively shallow and flow throughout winter as they pick up both surface and inputs from the area.

As most of the site has significant separation to groundwater, and the presence of sandy soils, rainfall recharge occurs during common rainfall events. An existing open drainage channel located along the site's northern boundary (North Lake Road) is capable of conveying any flows (under extreme events) from the site to Lake Yangebup.

2.4.2 Surface Hydrology and Wetlands

2.4.2.1 Geomorphic Wetlands of the Swan Coastal Plain

Department of Environment and Conservation (DEC) geomorphic wetlands dataset for the Swan Coastal Plain shows a Resource Enhancement (RE) wetland (UFI 6659) occurring over parts of 9504 Beeliar Drive and Lots 5 and 8 (**Figure 10**). The wetland condition ranges from 'Good to Degraded' with the degraded areas heavily infested with invasive weeds. Historical aerial photography indicates the wetland and surrounding area was cleared prior to 1965 for agriculture, and the topography of the depression area was deliberately altered at this time to provide water for cattle grazing (**Figures 4 to 7**).

The mapped RE wetland was dissected by the construction of North Lake Road in the early 1990's. The eastern portion of the RE wetland, east of Midgegooroo Avenue, has been cleared and filled and subsequently developed for residential purposes as part of Cockburn Central Town Centre.

The RE wetland is not hydraulically dependant on the eastern wetland chain protected in the Beeliar Regional Park. Further, the wetland does not have the same environmental values, classification or regional significance compared with wetlands such as Yangebup Lake, Thompsons Lake, Bibra Lake, Kogolup Lake and Little Rush Lake. These wetlands all occur within 5 km of the site, and are protected through the Beeliar Regional Park reservation and form a large contiguous reserve system.

2.4.2.2 Environmental Protection (Swan Coastal Plain Lakes) Policy 1992

Sections of the RE wetland are identified in the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (Lakes EPP) (**Figure 10**). Wetlands included within the Lakes EPP were based on areas of standing water on the record date, rather than environmental value.

The site was zoned 'Urban' as part of the Metropolitan Region Scheme (MRS) Amendment 1038/33 in 2002. In 2001, the Environmental Protection Authority determined the environmental impacts from MRS Amendment 1038/33 did not warrant a formal assessment under Part IV of the *Environmental Protection Act 1986* (EP Act). Instead, the EPA set an informal level of assessment and provided advice on the key environmental factors, which included the wetland in question.

The Office of the EPA, that while the wetland is not considered 'significant' approval under section 38 of the EP Act will be required to facilitate the proposed drainage and landscape works within the Lakes EPP boundary.

2.4.3 Groundwater

2.4.3.1 Groundwater Levels and Flow

The site is located within the Jandakot Groundwater Area.

Six groundwater monitoring bores were installed in 2010 to monitor groundwater levels and quality. Groundwater levels were sampled monthly from September 2010 to November 2011, and a one-off event was recorded in September, 2012.

Two bores (CC-1 and CC-4) are located within the low lying areas of the site and 4 bores (CC-2, CC-3, CC-5 and CC-6) were installed in the neighbouring Cockburn Central development. Monitoring bores were not installed throughout the remainder of the site as this area has significant clearance to groundwater (>10 m).

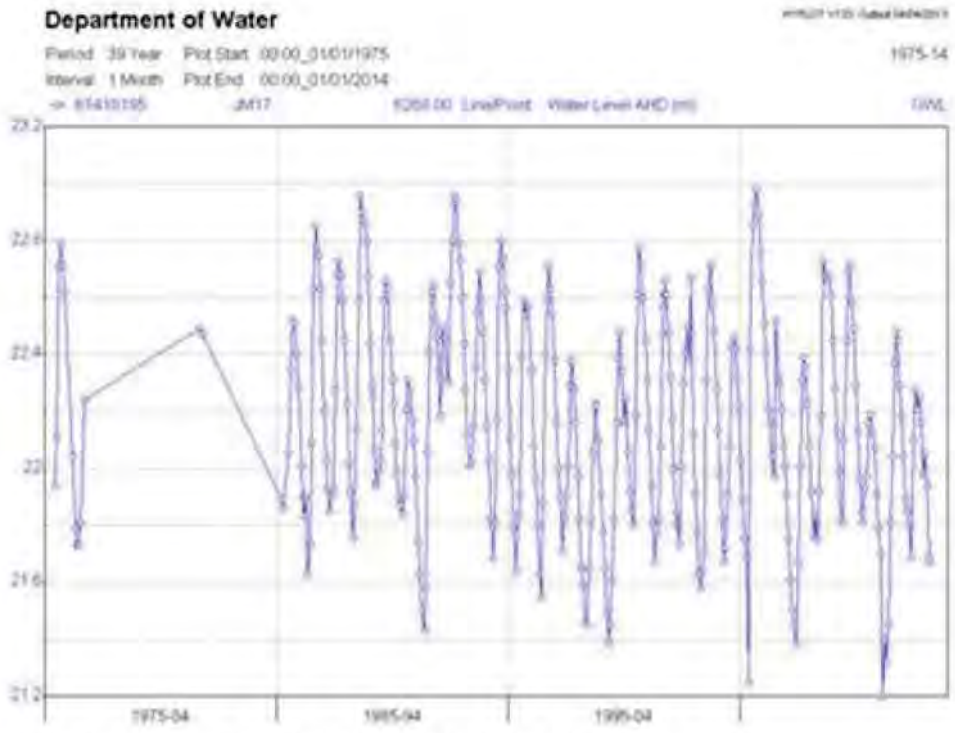
Figure 11 illustrates the monitoring bore locations, which also indicates that a DoW bore (JM-17) is located approximately 80m west of the site, data from which has been used to complete an assessment of groundwater trends at the site.

The Perth Groundwater Atlas (historical maximum levels) indicates that groundwater generally flows in a westerly direction and ranges in elevation between 24.0m AHD to 25.0m AHD (which confirms that the majority of the site has significant clearance to groundwater; >10 m).

The average annual maximum groundwater level (AAMGL) was calculated at the site using the onsite monitoring data and data from DoW bore JM-17 (WIN site 61410195) which has over 35 years of data. The AAMGL contours shown in **Figure 11** indicate the AAMGL at the site ranged from 22.75m AHD to 24.25m AHD.

The hydrograph from DoW bore JM-17 is shown in Graph 1. The hydrograph suggests the monitoring period was within ± 50 cm of AAMGL for the last 10 years in this region.

Liaison with Department of Water confirms the extent of current groundwater allocation for the aquifer in the South Lakes sub-area (refer to **Appendix H**).



Graph 1: Hydrograph for WIN Bore 61410195 (JM 17)

This information will be utilised in the LWMS prepared for the site in support of the Local Structure Plan.

2.4.3.2 Groundwater Protection

The site is located approximately 0.5 km north-west of a P3 Groundwater Protection Area. P3 Groundwater Protection Areas prohibit land uses that increase the risk of pollution (such as underground fuel storage tanks), however residential and mixed use commercial uses are permitted. Groundwater beneath the site flows away from the P3 area.

2.5 Acid Sulfate Soils

The WAPC Acid Sulfate Soil (ASS) mapping (2003) identifies the majority of the site as being moderate to low ASS disturbance risk at less than three metres from the ground surface (**Figure 12**). A small section of the site, within the vicinity of the Resource Enhancement wetland, is classified as high to moderate risk.

ASS are stable when left undisturbed, but when exposed to air, during excavation or dewatering, can result in acidity (sulphuric acid) being produced. The potential impacts may include acidification and release of heavy metals from ASS into shallow groundwater, which can be mobilised into deeper groundwater aquifers, and/or into nearby surface water bodies.

Preliminary ASS investigations indicate management measures may be required in the low lying parts of the site (particularly the RE wetland) to minimise any impacts associated excavation and dewatering. Where ASS has been identified and is proposed to be disturbed, an Acid Sulfate Soil and Dewatering Management Plan (ASSDMP) is required by the DEC, and is prepared as a condition of subdivision.

An existing DEC approved ASSDMP for areas within the site will be updated to include the full extent of the site in accordance with DEC's ASS guidelines. This will incorporate soil and groundwater investigations, planning to avoid ASS, and the management of disturbed ASS. The ASSDMP would include results of predicative groundwater modelling for dewatering operations.

2.6 Bushfire Hazard

A Fire Hazard Assessment was prepared for CCW by TME and is included as **Appendix M**. The assessment has been prepared to demonstrate that adequate regard has been given to *Planning for Bush Fire Protection Guidelines* in the design and development of the CCW subdivision.

The development is introducing substantial values (property and people) which must be protected from the risk posed by bushfires. The development forms part of the Cockburn Central Townsite and will contain mixed uses and recreation facilities.

The bush fire hazard primarily relates to the vegetation on the site, the type and extent (area) of vegetation and its characteristics.

The development of the site will inherently remove most of the bush fire hazard.

The proposed staging of the development, the landscape concept plan and the proposed development plan for the wetland are shown in Figures 6 to 8 of Appendix M respectively.

Stage 1A is the first stage of the development and will be for the Integrated Facility which will occupy the central eastern portion of the site, adjacent to the Western Power Public Purposes Reserve. This area will be cleared of all vegetation and earthwork to the appropriate levels. It is proposed that car parking will be constructed in the Western Power easement, with associated landscaping which will be maintained by the City.

Stage 1B covers the north-west portion of the site with mixed use residential, retail and commercial developments. It will be cleared and earthworked at the same time as Stage 1A. The Western Power easement in Stage 1B is earmarked to contain both car parking for the Integrated Facility and for the broader site.

Stage 2 incorporates mixed use development adjacent to North lake Road, Midgegooroo Avenue and the resource enhancement wetland, which will be maintained by the City of Cockburn. It is currently proposed that the wetland landscape works be undertaken in this stage, which will require removal of some vegetation and weed species from the perimeter of the wetland to allow the installation of drainage treatment swales, which will be vegetated appropriately to ensure a low fuel zone.

Stage 3 is the final stage of development. This area will be earthworked and cleared of vegetation. Lot 5 will remain as a balance title until appropriate services are delivered to the site, which is expected to be part of Stage 3 development works. It is proposed that the Western Power Easement is a maintained parkland/public reserve and used for drainage purposes.

As the subject land is surrounded by existing development, the primary fire management issue relates to any vegetation which is proposed to be retained on the site and areas where revegetation may occur. In particular:

a. Around the perimeter of Stage 1A including the existing wetland; and

b. The Western Power easement adjacent to Poletti Road.

The interface to Stage boundaries must be managed to ensure that there are no temporary fire threats while the development is being constructed. The simplest means of managing this is to provide a low fuel buffer separating the vegetation from the development.

In order to ensure that the buildings in Stage 1A have a BAL Low rating (with no specific construction requirements) it is necessary for the vegetation on the undeveloped stages within 100m of any proposed buildings is managed as a hazard separation zone.

LandCorp is proposing to clear all the vegetation with the exception of the wetland area. The wetland will be rehabilitated and the surrounding parkland will be developed in Stage 2. In the interim it is proposed to maintain the wetland as a low hazard zone subject to the approval of the City of Cockburn.

The principal fire management issue for CCW relates to the future development and management of any vegetation within the Western Power easement. The existing vegetation is currently a fire hazard not only to the intended development but also to the existing development on the western side of Poletti Road.

In accordance with Guidance Principle 4 of the *Planning for Bush Fire Protection Guidelines* the development will result in permanent hazard reduction by the removal of the vegetation hazard.

Provided that the Western Power easement and other landscaping/revegetation areas are developed and maintained as "low threat" vegetation, then the bush fire hazard rating for the subject land will be low.

If the Western Power easement remains undeveloped with the existing vegetation then it will be a bush fire hazard and it will be necessary to design the development in accordance with the *Planning for Bush Fire Protection Guidelines* including:

> Ensuring that buildings within 100m of the vegetation are constructed in accordance with AS3959;

> Providing individual building protection zones;

> Potentially providing boundary firebreaks and access for emergency vehicles.

If the easement is developed (eg: for car parking or maintained as "low threat" vegetation) then there is no bush fire hazard because this land would have a BAL Low rating.

It is proposed that the balance of the land under the easement will be maintained parkland/public reserve. LandCorp's preference is to reduce the BAL rating under the easement to Low, rather than push the onus of compliance with the *Bush Fire Protection Guidelines* and AS3959 on to the development within the site.

The landscape master plan can be designed to comply with the definition of 'managed parkland' through the spacing and selection of appropriate species. Existing vegetation can be maintained in cells having a maximum area of 2,500m^2 with a 20m separation between each cell.

Recommendations of the Fire Hazard Assessment:

1. That a 100m hazard separation zone be provided to the main building in Stage 1A as shown in Figure 11 of Appendix M. This includes, subject to the City's approval, maintaining the western portion of the wetland as a low fuel zone.

2. That the Western Power easement be managed as parkland/low threat vegetation as shown in Figure 12 of Appendix M.

3. That subject to Recommendations 1 and 2 the development in Stage 1A will have a low bush fire hazard level and it is not necessary for it to comply with the *Planning for Bush Fire Protection Guidelines*.
4. That in the event that the Western Power easement is not managed as low threat vegetation, then it will be necessary to prepare a fire management plan for the development and to ensure that buildings situated within 100m of the hazard vegetation are provided with appropriate fire protection and constructed to an approved BAL rating.
5. That any staging of the development must consider the management of the vegetation on the balance of the land and provide a 100m hazard separation zone.
6. That individual landowners must still comply with Council's Fire Control Order.

2.7 Heritage

Interrogation of the Department of Indigenous Affairs *Aboriginal Heritage Inquiry System* identified no registered Aboriginal sites within the subject site (refer to Aboriginal Sites Database report as **Appendix I**). However three "Other Heritage Places" were identified within the site. These include:

> a mythological site associated with the wetland

> isolated finds in and around the wetland; and

> an historical camp site.

Correspondence from the Department of Indigenous Affairs to LandCorp (dated 24 June, 2010) confirms that no registered sites are recorded within the subject site and therefore no approvals are required under the *Aboriginal Heritage Act 1972* (**Appendix I**).

2.8 Environment Protection and Biodiversity Conservation Act 1999

Flora and fauna of national conservation significance are protected by the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is important to note a Structure Plan is not the tool for determining whether an action requires referral to the Commonwealth government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The determination for either undertaking a referral and/or determining the significance of an impact on a threatened species is the responsibility of the proponent.

Separate to the structure planning process and consistent with the EPBC Act, an assessment by qualified environmental professionals has concluded that the proposal is unlikely to have a significant impact on any Matters of National Environmental Significance.

3 Structure Plan

3.1 Structure Plan Design Rationale

The design rationale for the preparation of the Structure Plan is primarily based on delivering the following project vision:

"An innovative mixed use development integrating regional recreational aspirations into the existing landform and surrounds whilst extending the urban fabric of the highly successful Cockburn Central Town Centre."

During the initial stages of the Structure Plan design, the Australian Urban Design Research Centre (AUDRC) was appointed to undertake a comprehensive design analysis that involved the consideration of numerous design options for the CCW site. The public open space and active sporting and recreation focus for the site was reflected in all of the design options. However, the Structure Plan design outcome was considered to have poor connections and the size and configuration of the development parcels required further consideration.

Following this, Urbis was appointed to examine the Structure Plan design in terms of various built form typologies, legibility and robustness of the development parcel sizes. A Design Review Panel undertook a further review of the Structure Plan design and considered the complexities of the site and the needs of different stakeholders in order to identify strategic principles to guide the Structure Plan design.

Critical outcomes from the design review process are as follows:

> Structure plan design needs to be robust by ensuring long term development flexibility and allow for a range of medium to high density dwelling types;

> Allow for finer grain built form and internal focus on ground floor activation at identified nodes;

> Internal roads constrained connectivity and legibility within the site and externally thereby adversely affecting the overall structure;

> Strong connections between the site and the Town Centre and surrounding locality is critical;

> The previously proposed POS circuit was problematic to design and manage;

> The design of the Integrated Facility needs to be integrated within the site and support the development of an activated streetscape;

> Need to better consider visual impacts of the power pylons and minimise impact within the site; and

> Urban water management should be based on a holistic best practice approach.

As part of testing the Structure Plan design and the sizes and configuration of the development parcels, Urbis considered a range of different types of building typologies, including terrace apartments, walk up apartments, apartment towers, multiple use (live/work) towers, podium apartments, maisonette and double loaded apartments. Therefore, there is a close relationship between the Structure Plan design and the future built form. Indicative built forms and building typologies have been developed by Urbis and are further considered in Section 3.3 of this report.

The validation and the design review processes resulted in changes to the Structure Plan design to address the following key elements:

> Achieving strong connections to the Cockburn Centre Town Centre as well as access routes from the north, south, and west;

> Maximising pedestrian and road connections into the site (taking into account intersection turning movement constraints);

> Accommodating stormwater volumes from the Town Centre and the CCW site;

> Achieving a cohesive urban form while integrating the playing fields and Integrated Facility;

> Accommodating a range of medium and high density building typologies in a flexible development pattern that can respond to the market;

- Creating an open space network that links with regional routes and trails;
- Facilitating appropriate land uses in appropriate locations to take advantage of the natural diversity within the site;
- Create landmark urban built form at Structure Plan corners and at key internal sites;
- Minimise the negative impact from the utility corridor and power pylons;
- Create a walkable, mixed-use district that can accommodate a range of residential, community, commercial, and retail uses;
- Create appropriately located retail nodes co-located with shared public spaces that mix pedestrians and motor vehicles;
- Maximising internal legibility and connectivity particularly between the northern and southern mixed use areas within the Structure Plan; and
- Work with the site contours to minimise retaining walls and preserve topographical variation.

The Structure Plan also places a strong "sense of place" orientation and amenity around the Integrated Facility, which is recognised as the key central development and major attractor and therefore needs to be integrated with its immediate locality. The open space is the "heart" of the design, however it is more integrated within the development areas of the site.

Consideration was also given to the limited amenity conditions along the western boundary adjacent to the Western Power infrastructure and along the northern and southern boundaries adjacent to Beeliar Drive and North Lake Road frontages, respectively. Due to the "hostile" external roads, it is envisaged that internal development on Mixed Use zoned land within the Structure Plan will be predominantly residential, whilst retail and commercial development will be located more externally within the site.

3.2 Land Use

The key land uses identified on the Structure Plan for CCW is open space, recreation, community and mixed use (ie. residential, commercial and retail), which is consistent with an activity centre that promotes mixture of compatible land uses. In general accordance with the original planning for the area, the Structure Plan provides an open space and community recreational focus within the central and northern portions of the site. It will be framed by surrounding activity centre type development (ie. medium to high density mixed use (residential, retail and commercial developments) in order to maximise the use and benefits of these open space and recreational areas. Public open space is further discussed in Section 3.4 of the report.

3.2.1 Integrated Facility

The Structure Plan includes a Public Purposes – Community Reserve covering 5.6ha for the development of the Integrated Community Facility and Primary AFL oval. The Integrated Facility will be a purpose-built regional recreational facility for the City of Cockburn with opportunities to accommodate shared use with sporting and tertiary education institutions. Different organisations will be able to benefit from shared facilities, which may include conference, training, sports courts and other commercial facilities. The co-location of recreational facilities in close proximity to other community assets such as the Cockburn Central Town Centre and rail and bus stations, the playing fields, mixed use development areas and the Gateways Shopping Precinct, maximises the public visibility, interest and accessibility of the Integrated Facility.

The specific facilities envisaged for the Integrated Facility include the following:

- Professional sporting club administration and training facilities;
- Community indoor and outdoor aquatic centre incorporating aquatic recovery;
- Community gym;
- Indoor elite training centre/indoor community sporting courts;
- Tertiary facilities, specifically health sciences facilities;
- Conference centre; and

> Other commercial/community facilities aligned to the overall facility purpose (i.e. café and crèche).

The Integrated Facility will function as an activated multi-purpose facility with strong links to its surrounding land uses. The Integrated Facility will be linked by strong pedestrian and cycling links to and from the Cockburn Central train and bus stations via the slow speed mixed traffic zone.

3.2.2 Western Power Easement

The Structure Plan also identifies the western portion of the site for Public Purposes – Western Power, comprising the existing overhead power lines (Western Power Easement). In order to maximise the use of this land, provision has been made for short term parking integrated with landscaping within the easement to support the Integrated Facility. It is envisaged that 700 bays will be provided within a number of short term car parking areas. This proposal has been approved by Western Power.

This reserve also accommodates a future road widening of Poletti Road. The design of any road widening will need to consider the existing Western Power pylons. A small parcel of land in the south-west corner of the site is identified as a Drainage Reserve, comprising the existing City of Cockburn drainage basin.

3.2.3 Mixed Use Zones

The Structure Plan proposes three Mixed Use Zones (Mixed Use – Residential, Retail and Commercial, Mixed Use – Residential and Commercial and Mixed Use – Retail and Commercial), which will lead to the required diversity in land uses, including medium and high density residential, retail and commercial (mainly offices) development. The intent of the Mixed Use Zones is to create flexibility in responding to future market conditions and not to spatially isolate any particular land use. The land use table included in Part One of the Structure Plan will identify whether land uses are either permitted, discretionary or prohibited in the three Mixed Use Zones. The objectives for each zone are also outlined in Part One.

As stated in the previous section, the existing hostile amenity conditions along North Lake Road and Beeliar Drive and the high level of visual exposure will influence the location of future land uses. Internal development on Mixed Use zoned land is likely to be mainly residential, whilst commercial development will be located more externally. Active retail land uses are also proposed along Midgegooroo Avenue and near the Integrated Facility to create an activated land use focus for the Structure Plan. Also the Mixed Use Zones are consistent with the intent of SPP 4.2 for the development of activity centres, which promotes the co-location of compatible uses, such as residential, commercial and retail.

Each Mixed Use Zone has a different land use focus based on the different locations within the Structure Plan. In particular, land parcels to the south of the primary oval and to the north and east of the playing fields are considered to be predominantly desirable for medium and high density residential development, creating two distinct residential precincts within the northern and southern areas of the Structure Plan. The land in these locations are proposed to be zoned Mixed Use – Residential, Retail and Commercial. However, retail and/or commercial development will only be permitted in the hatched areas, whereas in other locations these uses will be discretionary. A number of sites have been identified as landmark sites on the Structure Plan with a strong emphasis on retail and commercial development and appropriate built form, although multiple dwellings will also be permitted. The definition and requirements for landmark sites is provided in Part One of the Structure Plan.

On the Midgegooroo Avenue side of the Structure Plan, a number of parcels are proposed to be zoned Mixed Use – Residential/Commercial, which permits both residential and commercial development based on the land's proximity to the Town Centre and train station and other commercial development on the opposite side of Midgegooroo Avenue. Retail development would also be permitted in the red hatched areas to promote active land uses along Midgegooroo Avenue.

Only two areas in the north-west and south-east corners of the site are proposed to be zoned Mixed Use – Retail/Commercial, which reflects the land's high visual exposure and the lower residential amenity given the proximity to North Lake Road and Beeliar Drive.

It is envisaged that the majority of mixed use development over the site will be residential in nature (approximately 70-80%) with retail and commercial land uses located in some areas, particularly in hatched areas where retail and commercial uses will be encouraged at ground and possibly upper levels. The Mixed Use Zones will allow for flexibility in land use allocations at the development stage similar to the existing

Town Centre and for this reason it is not proposed to prohibit residential, commercial or retail development within any of the Mixed Use Zones. It is unlikely that every building in the hatched areas of the Mixed Use Zones will have active retail and commercial uses at the ground floor, although it is possible that this may change over time as the area develops and there is a higher population within CCW. This will be a key consideration in the Design Guidelines.

The wide range of land uses proposed in the Structure Plan is also consistent with the provisions for Cockburn Central in "DA23" in the City of Cockburn Town Planning Scheme No. 3, which proposes a multifunctional Town Centre which shall include a range of *"intensive residential and commercial development, shopping, entertainment, regional sport, bushland/wetland area and c ultural facilities supported by a highly interconnected transport system."*

All of these land uses are framed around an integrated and permeable movement network based on local roads, slow speed mixed traffic zone and shared pedestrian cycling paths. A key defining feature of the Structure Plan will be to maximise pedestrian linkages to the Cockburn Central Town Centre and the train station and bus interchange via direct east-west links to Junction Boulevard and Signal Terrace. A Transport Assessment prepared by GHD provides further details on the design and function of the road, pedestrian, cycling and public transport networks and the slow speed mixed traffic zone (refer to **Appendix E**).

The following table provides a breakdown of the various land uses, zones and reserves within the Structure Plan Area as the well as the estimated population.

Table 5. Structure Plan Summary Table

Item	
Total area covered by the Structure Plan	32.53 hectares
Land area of specific land uses (zones and reserves):	
Mixed Use – Residential, Retail and Commercial	5.7 hectares
Mixed Use – Residential/Commercial	3.47 hectares
Mixed Use – Retail/Commercial	1.23 hectares
Total land area of Mixed Use Zones	10.4 hectares
Public Purposes – Community (Integrated Facility and Primary AFL Oval)	5.63 hectares
Public Purposes - Utilities/Infrastructure	6.5 hectares
Park, Recreation and Conservation - Public Open Space	3.4 hectares
Park, Recreation and Conservation - Drainage	1.7 hectares
Estimated number of dwellings	Approximately 1000 dwellings (approximately 70% to 80% of the Mixed Use Zones)
Estimated population	1,800 (based on household size of 1.8)
Estimated retail/commercial floorspace	Approximately 20,000m^2 (gross floor area) (retail component approximately 3000m^2 to 4000m^2)
Integrated Community Facility	Approximately 23,500 m^2 (gross floor area)

The estimated lot yield for the site is unknown at this stage and will depend on future development demands, although it is envisaged that the site will comprise a variety of lot sizes to enable the development of different mixed use developments.

3.3 Future Built Form

The built form within CCW is envisaged to be of a medium to high density urban character, providing mixed use buildings and a range of residential living opportunities, consistent with an activity centre. A key objective of the Structure Plan is to facilitate residential development at a density that is complementary to the Cockburn Central Town Centre. Similar to the existing Structure Plan for the Town Centre, there are no densities specified on the Structure Plan. Instead the Design Guidelines will be used to guide development

density in lieu of the WAPC Residential Design Codes. The key principles that will guide the preparation of the Design Guidelines are outlined in Part One of the Structure Plan Report.

Notwithstanding this, Part One of the Structure Plan sets a dwelling target for the site. In accordance with SPP 4.2, the residential dwelling target per gross hectare for a secondary activity centre should range from 25 (minimum) to 35 (desirable). As denoted in Table 5 of the previous section, the objective is to provide for a minimum of 1000 dwellings within the Structure Plan Area. This equates to a dwelling target per gross hectare of approximately 30 dwellings for CCW, which is mid-way between the minimum and desirable dwelling target in SPP 4.2. This is considered to be reasonably high target given a substantial portion of the Structure Plan Area (approximately 70%) will comprise public open space, drainage, Integrated Facility, primary AFL oval, roads, and Public Purposes – Utilities/Infrastructure.

The indicative building layout plan (refer to **Figure 13**) shows that buildings will be located to address adjoining roads and public open space with building setbacks ranging from nil (commercial and retail uses) to 2-4m if residential uses are located at the ground level. Car parking will either be provided on-street or behind buildings at grade or possibly decked parking. This creates a built form that is consistent with the Town Centre and a highly urban activity centre.

The Design Guidelines for the site will ensure that buildings are broken up into smaller increments to encourage architectural variety and a 'fine grain' streetscape texture. Large monolithic buildings that take up long stretches of a street will be avoided in accordance with the Design Guidelines principles.

Figure 13 also shows the various residential and mixed use building typologies that could potentially be developed within the Structure Plan, including terrace apartments, walk up apartments, mixed use apartments and maisonette apartments.

In terms of building height, the maximum height will be guided by the limitations imposed by the Jandakot Airport flight path contours (approximately 17 storeys). This is consistent with the existing Town Centre. However, to ensure that a minimum density of development is achieved over the site it is proposed that Part One of the Structure Plan Report will set a minimum building height of 3 storeys across the whole Structure Plan Area. In some locations the building height may be reduced to two storeys to allow for attached grouped dwellings (ie. terraces), however this would be restricted to land zoned Mixed Use (Residential, Retail and Commercial). The lower building heights will be counterbalanced by higher buildings in other locations.

The principles for the Design Guidelines also requires the future guidelines to address housing diversity, which is also reflected in the indicative building layout plan. Housing diversity will occur by allowing different types of housing and through a variety of dwellings sizes (ie. different number of bedrooms) to cater for different household types such as singles, young couples, families, seniors and other household groups.

3.4 Public Open Space

The Structure Plan provides a strong open space focus within the central and northern portions of the site and provides the total public open space (POS) provision for CCW, addresses the POS shortfall from the Town Centre and provides regional open space and recreational functions (refer to **Figure 14**).

The location and arrangement of POS and the Integrated Facility is the underlying design driver of the Structure Plan. As stated in a previous section, careful management will be required to ensure safe pedestrian and cycling access between the different recreational areas, in particular between the playing fields, drainage and wetland area and the Integrated Facility. In order to manage pedestrians, vehicles and cyclists, the Structure Plan proposes a slow speed mixed traffic zone, which is explained in the Transport Assessment (refer to **Appendix E**). Without an east-west connecting road, a consolidated public open space and Integrated Facility site would create a "barrier" that would isolate the northern and southern precincts within the site, thereby reducing internal and external connectivity.

The Structure Plan design also aims to provide a robust public realm which is diverse and functional, providing a variety of experiences and hierarchies of public space. It is critical for the POS to be welcoming and a valued asset within the local community and ensuring that it is safe and well used. Therefore, future POS design will be critical and detailed consideration will need to be given to fundamental aspects of surveillance, edge activation and ease of access. As part of the Local Water Management Strategy, an indicative plan has been included to show how the drainage and wetland area may be developed and to

demonstrate there is sufficient land area for the intended functions, however it is only a concept plan that is subject to detailed design following the Structure Plan stage. Given the regional nature of the POS areas, it is envisaged that Council will undertake detailed design, development and management of the public open space areas with the exception of the drainage and wetland area, which will be designed and developed by LandCorp.

The public open space components for CCW are:

> The playing fields with a land area of 2.5ha which potentially incorporates two playing fields and other appropriate recreational amenities (such as a children's playground, cricket nets and change rooms); and

> A drainage and wetland area with an approximate land area of 2.4ha which will be the key drainage area for the site and parts of the Town Centre (ie. Stage 2). The details of the drainage and wetland area are addressed in the Local Water Management Strategy (refer to **Appendix F**).

In accordance with Liveable Neighbourhood, public open schedules have been prepared for Cockburn Central Town Centre and CCW site (refer to **Appendix D**). The POS schedule for the Town Centre shows a POS shortfall, which was expected given no POS other than the town square was provided. In accordance with long term planning intentions for the site, a substantial area of open space area is provided within CCW that addresses the POS shortfall. The POS Schedule for CCW shows that there is a POS surplus of 0.69ha.

It should be noted that the AFL Oval has been included in the Public Purposes – Community Reserve together with the Integrated Facility and as such has not been included in the POS calculations.

3.5 Place Making

Place making involves the creation of public spaces and communities that respond to the needs of people living, working and recreating in these areas. It is critical that public spaces within CCW, such as the Integrated Facility and the open space areas, are places that are diverse, accessible, interesting, positive, safe and useable to a wide range of people. A place-based approach also considers ongoing place management to ensure high levels of public use for a wide range of groups and to manage any conflicts between user groups and the organisation of general public activities and events. LandCorp has a Place Making Implementation Plan for the adjacent Town Centre. It is intended the Implementation Plan would be expanded to cover CCW. Notwithstanding this, the proposed Integrated Facility also offers the project a significant opportunity to deliver on place-based objectives.

3.6 Movement Network

GHD prepared a detailed Transport Assessment for the Structure Plan in accordance with WAPC's *Transport Assessment Guidelines for Developments: Volume 2 – Structure Plans*. It considers both the existing and future movement networks (roads, pedestrian and cycle links and public transport) within the site as well as externally in the surrounding area. The findings of the Transport Assessment have influenced the final Structure Plan design. The Transport Assessment is included in **Appendix E** of this report.

Subsequently, Urbsol was commissioned to prepare a supplementary Traffic Impact Analysis, included in **Appendix N**. The purpose of the Urbsol report was not to replace the GHD assessment but to:

> Update the traffic generation estimates for the site in light of latest landuse yields

> Model the development impact using more sophisticated techniques

> Assess the performance of impacted intersections

> Identify traffic contributions to flows on impacted roads from the site as a whole and specifically the Regional Recreation Centre (Integrated Facility).

The GHD and Urbsol reports should therefore be read together.

The key findings of the GHD Transport Assessment include:

> The site is surrounded by a number of key arterial roads that will be modified and widened over time to meet the wider area's future traffic needs. The arterial roads are: North Lake Road (located to the north of the site), Beeliar Drive (located to the south of the site and connects directly to the Kwinana Freeway), Poletti Road (located to the west of the site), and Midgegooroo Avenue (located to the east of the site). All

of these roads and additional future connections to the Kwinana Freeway and to the east of the freeway provide a high level of accessibility to the subject site.

> Main Roads WA provided traffic volume outputs from its Regional Operations Model (ROM) for the road network by 2031. The anticipated future traffic volumes will lead to the upgrading and modifications of the following roads and intersections:

a. North Lake Road to be realigned and widened to two lanes in both directions and extended to Knock Road, which will involve new north freeway ramps at the intersection with the Kwinana Freeway and a freeway flyover providing an alternative east-west route to Armadale Road/Beeliar Drive. These works will be undertaken by Main Roads.

b. Widening of Beeliar Drive to the south of the site and east of Wentworth Avenue to three lanes both ways to relieve future traffic congestion in this location. This upgrade is primarily triggered by additional retail development at the Gateway Shopping Centre. These works will be undertaken by Main Roads and the owner of the Gateway Shopping Centre.

c. Poletti Road will become an important north-south link and will be an alternative option to the freeway. Council is considering the widening of the road and upgrading intersections and will allow vehicles travelling on the RAV 2, 3 and 4 networks to use this route. A proportionate contribution is required to the upgrading of this road and associated intersections based on traffic generated by the Mixed Use Zones (Note that the Urbsol report in **Appendix N** addresses the matter of proportionate contribution in more detail).

d. Midgegooroo Avenue is proposed to be a dual lane carriageway in both directions but with reduced speeds (50km/hr) to provide a strong pedestrian link between the site and Cockburn Central Town Centre and the train station.

e. Midgegooroo Avenue/Beeliar Drive/Gateway Shopping Centre Intersection which is already signalised will be upgraded by Main Roads to accommodate traffic growth projected by the ROM model. The intersection is currently being designed and upgraded due to the traffic increase created by Gateway Shopping Centre and will be completed within the next 5 years.

f. Wentworth Parade/Beeliar Drive and Poletti Road/Beeliar Drive Intersections will be signalised by Main Roads to facilitate the proposals to increase lane numbers along Beeliar Drive and Poletti Road and the increase in traffic volumes projected by the ROM model.

g. Midgegooroo Avenue and North Lake Road intersection will be realigned and upgraded with signals as part of the Stage 2 development of the Cockburn Central Town Centre.

h. North Lake Road and Poletti Road intersection to be upgraded by Main Roads/City of Cockburn with traffic signals based on the predicted ROM model traffic volumes and any upgrade of Poletti Road. A proportionate contribution is required to the upgrading of this intersection based on traffic generated by the Mixed Use Zones (refer to Part One).

i. The upgrading of Midgegooroo Avenue will include the addition of signals at its intersection with Signal Terrace, mid-way along the eastern boundary of CCW and adjacent to proposed public open space.

The proposed road and intersection upgrades will significantly alter the traffic movements through the area by providing more travel route options than currently exist. The traffic demand will disperse over a wider area thereby reducing congestion, particularly along Beeliar Drive. There is no likelihood that Beeliar Drive will see any significant change of congestion in comparison to any other road in the local road network. The network changes will assist in providing additional capacity to accommodate traffic volumes predicted to increase by 2031.

3.6.1 Trip Generation

Urbsol prepared a large scale dynamic assignment model for Main Roads WA using a state-of-the-art transportation simulator called VISSIM. The model was prepared as part of the North Lake Road Access Strategy (NLRAS) for an area that includes Cockburn Central and CCW. Trip generation used in the VISSIM model for NLRAS was largely based around equations used in Main Roads' ROM. For the assessment for

CCW, the ROM generated demand was replaced by trip generation by land uses proposed within CCW. This analysis is therefore a refinement.

Table 6 shows the demand estimates considering the rates and directionality (AM and PM peaks/inwards and outwards movements) used in the analysis.

Table 6. Site Trips Estimated by Urbsol

			Generation			AM		PM		Daily	
Development Site	**Land Use**	**Units**	**AM**	**PM**	**Daily**	**In**	**Out**	**In**	**Out**	**In**	**Out**
Stage 1A	Rec. Centre	23,500	410	367	5,788	250	160	136	231	2,894	2,894
	Dwellings	64	19	25	239	6	13	14	10	120	120
Stage 1B	Dwellings	145	43	56	543	13	30	33	24	271	271
	Office	2,300	42	37	283	38	5	5	32	141	141
	Retail	1,000	74	54	477	35	38	24	30	239	239
Stage 2	Dwellings	423	127	165	1,588	39	88	96	69	794	794
Stage 3A & 3B	Dwellings	216	65	84	812	20	45	49	35	406	406
Stage 3C	Dwellings	152	46	59	572	14	32	34	25	286	286
	Office	4,225	70	68	501	63	8	9	58	250	250
TOTALS			**896**	**915**	**10,802**	**479**	**418**	**400**	**515**	**5,401**	**5,401**

These estimates were modelled for peak periods in the immediate vicinity of CCW. From this, levels of service (LOS) for key intersections. Intersection LOS is the critical measure of network capacity, with LOS A being the best, and anything below LOS D being unacceptable.

Urbsol concluded that:

> In terms of the immediate intersections analysed as part of this project all access points from and to the development area are expected to operate well at LOS of A under normal priority control.

> Intersections on the more regional road network considered are expected to largely operate within acceptable limits (LOS D or less).

> At a daily level the total development area in CCW is expected to contribute 20% of the projected Poletti Road flows with the Integrated Facility responsible for 12% and the remaining Cockburn Central at 8%. Regional movements will account for the remaining 80% of traffic.

> In terms of the Midgegooroo Road / Signal Terrace intersection the development as a whole is expected to contribute 5% to the peak hour flows – the majority of which are related to Cockburn Central development (4%) with the Integrated Facility responsible for approximately 1% of the volumes. The remaining 95% of traffic using the intersection is expected to be regional movements.

Table 7, by GHD, provides estimated 2031 traffic volumes for key roads surrounding the site. These figures are derived from the Main Roads ROM Model output data. It should be noted that the heavy vehicle volumes proportions are a rough estimate only.

Table 7. 2031 Traffic Volumes

Link Road	ROM Model Traffic volume (Estimated for 2031)	Proportion of Heavy Vehicles estimated	Road Hierarchy type
Poletti Road	14,500	4%	Local distributor/ access road
North Lake Road	22,000	4%	Distributor A
Midgegooroo Avenue	21,000	3%	Distributor A
Beeliar Drive	17,000	5%	Distributor A

The internal road network will comprise a series of local access roads ranging from 6m to 7.4m in road pavement width, with footpaths provided on both sides of each street. A slow speed mixed traffic zone is identified within the Structure Plan and these will be designed using 'Woonerf' or 'Home Zone' principles.

A detailed technical note for the proposed slow speed mixed traffic zone is included in Appendix G of the GHD Transport Assessment Report (**Appendix E**). The slow speed zone will allow pedestrians, cyclists and vehicles to share the same space and there will be little or no demarcation to separate the different users. The technical note provides numerous examples to demonstrate how the slow speed zone may work for CCW.

Indicative street cross sections based on guidance from *Liveable Neighbourhoods* are provided in Figures 19, 20 and 21 of Appendix E for 7.2m (15.4m road reserve) wide local access roads, 6m (14.2m road reserve) local access roads, and 6m laneways, respectively. Laneways are not shown on the Structure Plan but may be incorporated in appropriate locations to provide permeability to individual developments but this will be determined at the subdivision stage.

The site is already well serviced by public transport commensurate with a TOD development. In particular the Cockburn Central train station and bus interchange is located within 10 minutes walking distance or approximately 350m to the east of the site. Cockburn Central train station provides car parking, cycle storage, and good pedestrian facilities that allow for multi modal travel connections (ie. walking, cycling and driving). There are also six bus routes that operate with 800m of the site that link the area to numerous destinations, including Fremantle, Hammond Park, Amblin Grove and Murdoch. Additional public transport for the area included the addition of 450 park and ride spaces, which were installed at the end of 2012. The PTA has also advised that they are proposing to create a new bus link to connect Cockburn Central train station with the proposed redevelopment of the current retail site to the west of CCW site.

3.6.2 Pedestrian Network

A high level of pedestrian permeability is a key objective of the CCW Structure Plan and connectivity to adjacent facilities to the south and east would substantially enhance the "place of value" of the entire precinct. In particular, it is proposed to have strong pedestrian connections across Midgegooroo Avenue to the east and south-east to the Town Centre and the Gateway Shopping Centre, respectively. In addition, pedestrian connectivity will also be promoted to the west along North Lake Road, Beeliar Drive and Poletti Road and connecting to the cycle/pedestrian link to Yangebup Lake. Most importantly, the Midgegooroo Avenue/Beeliar Drive intersection provides controlled signalised crossing facilities linking the site to main attractors such as the Gateway Shopping Centre. An additional signalised pedestrian crossing is proposed to be developed at the Beeliar Drive and Wentworth Parade intersection. For this reason, a pedestrian cycling link has been provided on the Structure Plan that will directly link to this intersection. As discussed, pedestrian accessibility across Midgegooroo Avenue with a 50km/hr speed limit is an integral component of the structure design and Sections 4.7 and 5.4.1 of the Transport Assessment considers three different options. At grade crossings is the selected option and reduced speeds to 50Km/hr is critical to established high levels of accessibility between the site and the Town Centre and train station. Two important east-west crossings are proposed at Junction Boulevard and Signal Terrace with the latter crossing being a signalised pedestrian intersection. The possible future upgrading of other intersections (ie. Poletti Road/Beeliar Drive and Poletti Road/North Lake Road) with traffic signals should also include pedestrian crossing facilities and phases. A pedestrian and cycle plan is provided in the Transport Assessment, which is also reflected on the Structure Plan.

3.7 Parking Strategy

High Quality design of vehicle parking is essential to both functionality and visual quality throughout CCW. Parking standards and provisions within CCW will be generally consistent with those standards and provisions applicable to the Cockburn Central Town Centre. As the Town Centre and CCW are centered on transit-oriented development principles, given the proximity to the bus and rail interchange, there is a strong argument to suggest that parking demand within the site will not be as high as for traditional forms of development and for this reason there should be flexibility with the provision of parking for individual developments. Therefore, the parking standards and provisions for the Structure Plan Area will seek to provide an appropriate balance between parking supply and demand in the long term, whilst encouraging the use of public transport and walking and cycling.

The objectives for CCW for the provision of car parking areas are to:

> Provide sufficient and safe car parking;

> Ensure that on site vehicle parking and access are appropriately located to minimize adverse visual impacts; and

> Limit the amount of car parking to encourage the use of public transport and walking and cycling.

Car parking within CCW will be provided through designated short-term parking spaces located within the Western Power Easement, short-term on-street parking within the slow speed mixed traffic zone and local access roads and also on-site private parking.

Parking within the Western Power Easement will provide short-term parking primarily for users of the Integrated Facility and the playing fields. It is not intended to be used by commuters. Parking within the slow speed mixed traffic zone and local access roads will also be of a short-term nature and will be more suited to visitors of residents, users of the playing fields and for those seeking goods and services offered within the site.

The short-term parking facilities will be managed by the City of Cockburn following appropriate consultation and agreements with relevant stakeholders.

The vehicle parking provisions for CCW, which are included in Part One of the Structure Plan are intended as a guide only and that there will be flexibility for individual developments. The rates are as shown in Table 8.

Table 8. Cockburn Central West Car Parking Rates

Use Class	Minimum Number of Car Parking Bays
Residential Dwelling	0 per dwelling unit, with a maximum of 2 bays per dwelling: 1 car bay for three (or more) bedroom dwellings with a maximum of 2 bays per dwelling. Visitor car parking is to be a minimum of 10% of the total residential car parking requirement and be provided in addition to the required residential car parking. On-street parking located adjacent to the frontage of a lot can be allocated towards visitor parking.
Retail (where the built form does not facilitate an easy transition to "Office" uses)	4 bays per 100m² GFA
Office (where the built form does not facilitate an easy transition to "Retail" uses)	2.5 bays per 100m² GFA
Mixed Use (where the built form facilitates alternative opportunities to "Office" and "Retail" uses)	3 bays per 100m² GFA

3.8 Potential Transport Noise

The implications of the *State Planning Policy 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning* have been considered in relation to the site. The principal trigger for the consideration of this policy is Clause 5.2.2 relating to major roads. The policy is applicable to any proposed development for a noise-sensitive land use that would normally require planning approval by a local authority or the WAPC, which includes proposals at the scheme amendment, structure planning, subdivision and development application stages.

SPP 5.4 sets out the outdoor and indoor noise criteria that apply to proposals for new noise-sensitive development (ie. residential uses). If a noise-sensitive development takes place in an area where outdoor noise levels will meet the noise target, no further measures are required under the policy. Where the noise target is likely to be exceeded, but noise levels are likely to be within the 5dB margin, mitigation measures should be implemented by the developer with a view to achieving the target levels in at least one outdoor living area on each residential lot. Where the outdoor noise limit is likely to be exceeded, a detailed noise assessment in accordance with the policy guidelines should be undertaken by the developer.

For the purposes of applying SPP 5.4 to the site, a major road is taken to mean one of the following:

- State roads and national highways;
- Urban primary distributors as described on the metropolitan functional road hierarchy (MRWA, local government) framework (see attached);
- Other urban roads carrying more than 20,000 vehicles per day;
- Other rural primary distributors carrying more than 5,000 vehicles per day;
- Primary freight roads (Metropolitan, South-West and state wide).

GHD has confirmed that both Beeliar Drive and North Lake Road are classified as District Distributor Category "A" roads, with Beeliar Drive east of the Kwinana Freeway classified as a Primary Distributor. Therefore, the main trigger in this case is the future traffic volumes. Table 7 shows the traffic volumes for the sections of roads adjoining the site.

On the basis of SPP 5.4, both North Lake Road and Midgegooroo Avenue slightly exceed the 20,000 vehicles per day and are therefore technically defined as major roads, assuming the estimated volumes are realised. In this case it is considered more appropriate for noise assessment studies to be prepared at the development application stage for individual residential developments in order for such studies to recommend specific (rather than general) noise amelioration measures suitable to the individual development. It is envisaged that the measures are likely to be based on quiet house design principles that specifically relate to detailed building design and location of outdoor living areas, which are not known at the structure planning stage.

There is no value in preparing a noise assessment (acoustic) report as part of the Structure Plan as the outcomes would not impact directly on the structure plan design. It would be inappropriate to adopt other measures normally proposed for single residential lot subdivisions, such as walls, bunds or landscape buffer areas, particularly when the site is located within an existing urban environment and the future volumes for 2031 barely achieve the level for a major road. Also the Structure Plan promotes where possible commercial and retail development around the edge of the site, which will potentially reduce the extent of residential development near the major roads.

Transport noise is identified in the Structure Plan (Part One) and Design Guidelines to ensure noise assessment reports are prepared at the required development application stage for future lots abutting North Lake Road, Midgegooroo Avenue and Beeliar Drive. Even through the future traffic volumes for Beeliar Drive are below 20,000 vehicles per day, it is also considered to be a major road.

3.9 Local Water Management Strategy

The *Better Urban Water Management* framework (WAPC October 2008) established the requirement for a Local Water Management Strategy (LWMS) to be prepared to support a Structure Plan application. A LWMS has therefore been developed by RPS on behalf of LandCorp to support the CCW Structure Plan (refer to **Appendix F**).

The LWMS has been updated to support the revised CCW Structure Plan, which was endorsed by the City of Cockburn in November 2013. The LWMS details the integrated water management strategies to facilitate future urban water management planning by presenting details on the wetland concept designs, landscaping and stormwater management and design criteria.

An Urban Water Management Plan (UWMP) will be prepared as a condition of subdivision. The UWMP will provide the detailed engineering and landscaping plans for the stormwater management system and wetland design. It will also include final monitoring locations, time frames and responsibilities for implementing the UWMP.

3.9.1 Water Conservation Strategies

Water conservation measures will be implemented through the building design and POS design and landscaping.

3.9.2 Building Design

All building applications must comply with the following water efficiency measures:

- All dwellings must have a hot water system that has a minimum five star rating or is a solar hot water system (that is either gas boosted or electric boosted with a timer).
- All dwellings are to install AAA rated showerheads.
- The following water efficiency measures are not mandatory for all dwellings but will be encouraged using educational material:
- installation of AAA water efficient appliances including washing machines and rain water tanks
- installation of waterwise gardens.

3.9.3 POS Design and Landscaping

The CCW development includes medium to high density living. This style of development reduces private gardens and increases courtyard style gardens and street front treatments. Therefore, the water quality collected through the drainage system from the built lots is expected to be of a higher quality, when compared to a traditional lower density urban development.

The preliminary Landscape Plans are contained in Appendix 4. The concept wetland plan is consistent with the design presented to the EPA during the S38 referral process. The POS and wetland design will be subject to more design iterations, in consultation with the City of Cockburn and Department of Park and Wildlife as the development progresses to subdivision.

A Wetland Management Plan will be prepared as a condition of subdivision. A separate Landscape Plan, outlining the required maintenance will be developed for the POS and playing fields to ensure compliance with development design guidelines and water management strategies. POS designs and plans will be subject to review as a condition of sub division and will be developed and maintained to a minimum standard for two summer periods. Further information will be included in any subsequent UWMP.

3.9.4 Stormwater Management

The site will effectively manage stormwater through the implementation of Water Sensitive Urban Design (WSUD) principles and Best Management Practices (BMPs) to control water quality and quantity from both minor and major storm events.

The drainage design involves maximising at-source infiltration of stormwater wherever possible to promote the dispersed recharge of stormwater to the water table. To this end, all the commercial and residential lots will be required to manage their own stormwater using soakwells.

The intent, as shown on the Landscaping Plans, is to incorporate roadside and median strip tree pits within road reserves. The pits/soakwells located in the road reserves will be connected to shallow stormtech infiltration chambers for collection and infiltration of stormwater generated in events up to and including the 5-year ARI event.

Due to stormwater flows also entering Cockburn West from the neighbouring development (Cockburn Central East), an alternative to the conventional piped system is required to minimise the volume of stormwater entering the wetland located on site.

In lieu of piping, a system of underground infiltration units will be connected such that all flows are detained and infiltrated into the sandy soil which from on-site geotechnical investigations (Douglas Partners 2014), display good infiltration properties.

Once the stormtech system has exceeded capacity (greater than the 5-year ARI), stormwater will bubble up and follow an overland flow path via the road reserves for discharge to either the drain located along North lake Road, proposed playing fields in the north or to the wetland.

Stormwater entering the wetland will initially enter the bio-filtration swales located on the perimeter, which will be sized to contain the first flush. The swales will be connected through a series of weir structures and will overtop into the main body of the wetland at dispersed rock pitched locations to control erosion and increase opportunities for stormwater treatment. The swales will be set above maximum groundwater levels.

A catchment in the north east of the site will discharge to the existing open drain adjacent to North Lake Road via suitably sized culverts. This design approach has been discussed with and agreed to by the City of Cockburn.

All stormwater from the proposed AFL oval and playing fields will be contained within their boundary; no stormwater from these areas will enter the wetland.

3.9.5 Groundwater Management

Groundwater levels have been monitored from six bores through 2010–2011 and a single winter event in 2012. The monitoring data and DoW bore JM-17 have been used to calculate groundwater levels at the site.

As discussed above, the drainage design relies on stormwater entering bio-filtration swales located around the perimeter of the wetland. To encourage stormwater treatment and infiltration within the swales, every effort has been made to raise the wetland bio-filtration swales as high as practicably possible.

Many of the proposed stormwater measures will improve stormwater quality and subsequently groundwater quality through the following mechanisms.

- increasing biological uptake through vegetating the POS and wetland area with native and or waterwise vegetation
- reducing water velocities by diverting water through streetscape swales and bio-filtration swales and bubble up pits on the perimeter of the wetland
- minimise and control the levels of fertilisers and pesticides applied to the site through appropriate plant selection and operation and maintenance
- monitoring water quality and levels within the wetland system to verify that suitable values are being maintained.

3.9.6 Water Quality Treatment

- **Vegetation**

  Vegetation will be included in all suitable stormwater structural controls where possible to help prevent erosion, maintain soil infiltration, restrict water flows and remove particulate and soluble pollutants, particularly nitrogen. The plants will mainly be associated with the streetscape tree pits and wetland bio-filtration swales and will be appropriately selected based on their intended function using native endemic vegetation where possible and suitable.

  A combination of underground Stormtech cells and streetscapes swales are to be used to encourage at source stormwater infiltration throughout the site.

  The wetland plant species list produced during the detailed wetland survey in March 2013 will be used as a guide by Ecoscape in developing the landscaping strategy for the wetland and surrounding POS design. The plant species used within the structural devices and irrigation requirements will be confirmed within the subsequent UWMPs.

- **Gross Pollutants Traps**

  Two gross pollutant traps placed prior to the stormwater outfalls into the wetland will be used to collect rubbish and coarse sediment from stormwater entering the wetland swales.

3.10 Education Facilities

The Department of Education has been consulted as part of the preparation of the CCW Structure Plan in regard to the primary and secondary school catchment areas for Cockburn Central, and the requirements for additional educational facilities. A number of primary and secondary school sites are well dispersed throughout the surrounding Cockburn Central catchment area. It is considered that the current provision of primary and secondary school sites surrounding the Cockburn Central locality is sufficient, with the Department of Education advising that there are no other proposed schools currently identified within the vicinity. As such, the Structure Plan does not propose to include any primary or secondary educational facilities within the site.

It is possible that a tertiary institution may include some facilities within the Integrated Facility related to health sports science. However, the final details are not known at this stage

3.11 Activity Centres and Employment

Cockburn Central, which includes Cockburn Central West, is identified as a secondary centre under SPP 4.2. An Activity Centre Structure Plan is required to be prepared for the site. All of the elements of an activity centre such as employment, intensity and diversity are dealt with in Section 1.3.9 of the report. Under all three elements, Cockburn Central in 2008 was performing below expectations for a Secondary Centre, however based on an assessment undertaken by Pracsys, the performance of Cockburn Centre will significantly improve with the development of Stage 2 and CCW. The development of the Integrated Facility is expected to contribute significantly to strategic employment creation within the Cockburn Central Activity Centre.

Also Section 1.3.5 of the report, addresses in detail all of the other elements identified in SPP 4.2 as critical to the successful operation of an Activity Centre.

Whilst CCW may be on the western edge of the Cockburn Central Activity Centre, it will contribute positively to the development of a diverse and vibrant activity centre by providing additional uses that are not provided for in the Town Centre, particularly the open space and regional recreational uses. These additional uses will serve the wider locality and form an important attractor that will increase intensity and activity within the site.

3.12 Infrastructure coordination, servicing and staging

Pritchard Francis prepared an Engineering Servicing Report for an earlier version of the Structure Plan (refer to **Appendix G**). It considered the staging of the site, proposed earthworks and retaining walls, and the provision of services including stormwater drainage, water, sewer, power, gas and telecommunications. The findings of the Engineering Servicing Report have influenced the current Structure Plan design. Whilst the servicing advice in the Pritchard Francis report is still relevant, an addendum report has been prepared by Arup providing an update on stormwater drainage, sewerage and the staging order based on the latest Structure Plan design (refer to **Appendix J**).

A summary of the key findings of both servicing reports are included below:

> The Structure Plan Area is divided into three main development stages; Stage 1 being the central and north-western areas including the Integrated Facility, primary AFL oval and the playing fields, Stage 2 being the north-eastern and central areas of the site including the wetland and drainage area and Stage 3 being the southern portion of the site.

> Bulk earthworks and retaining walls will be required over parts of the site to create lots and POS areas. An updated preliminary earthworks plan is included in the Arup Servicing Strategy. Where possible, the proposed levels will integrate with the existing topography, grading higher land on the southern side of the site down to tie in with the lower levels in the north-eastern portion of the site.

> Water services are available from both Midgegooroo Avenue and Poletti Road.

> Sewer services are available from the existing sewer main in North Lake Road and Poletti Road. Also there may be a requirement for a sewer pumping station within the site. This requirement will be determined at the detailed design stage.

> Stormwater will be discharged to the drainage area in the central portion of the site using current best management practices, which is further outlined in the Local Water Management Strategy.

> Electrical supply to the site will be serviced from the existing Western Power network. Existing power HV cables are located in Poletti Road and in Midgegooroo Avenue, which will supply the site. High voltage power lines (330Kv) run along the western side of the site but no connection to this power supply is proposed.

> The provision of telecommunication services to the site will be through the National Broadband Network (NBN).

> The site will be connected to the underground gas network via extensions of the existing network in Midgegooroo Avenue and Poletti Road.

> An existing high pressure gas main is located along the southern side of North Lake Road and as such a 17.5m setback is required to any structures. The Structure Plan shows a gas pipeline buffer along the northern boundary of the site with a proposed local road and some Mixed Use zoned land shown within the buffer. Building construction within the Mixed Use zoned land will need to be setback to avoid the buffer.

3.13 Context and Other Land Use Constraints

A context and constraints plan (refer to **Figure 15**) has been prepared which overlays the Structure Plan with future and existing elements such as servicing, movement network (for motorists, cyclists and pedestrians), surrounding land uses and public open space. The plan shows the site within the context of the surrounding locality including its connections to the external road network, the Town Centre and the Gateway Shopping Centre.

3.14 Developer Contribution for Community Infrastructure

All new residential developments within the City of Cockburn are subject to development contributions for community infrastructure. Amendment No. 81 to the Scheme included a Development Contribution Plan for the collection of monies to fund certain items of community infrastructure required to service existing and future communities. CCW is included in Development Contribution Area (DCA) 13.

The need for the various items of infrastructure has been verified in a number of Council strategies and documents, including the City's Sport and Recreation Strategy, Bicycle Network and Footpath Plan, and the Bibra Lake Landscape, Recreation and Environmental Management Plan. The demand for new community facilities from the existing population is excluded from the Development Contribution Plan. The contribution is triggered by subdivision and development applications for residential development.

There are numerous items of infrastructure within the DCP to be provided at the regional, sub regional and local levels. In particular, the Cockburn Central Recreation and Aquatic Centre and the Cockburn Central Communities Facilities (located on the site) and the Cockburn Central Library and Communities Facilities (being developed to the south of the site) are included in the DCP and will directly benefit future residents within CCW.

Due to the site being held under single ownership (ie. WAPC), other than a small portion of land in the south-west corner (vested in the City of Cockburn), it is not anticipated that any other Development Contribution Plans will be required for the development of the site.

Approval of the CCW Structure Plan will change the scope of the previously planned 'Cockburn Central Heritage Park' within DCP 13 to a memorial walk trail, which maintains the general intent of the original proposal and provides for additional opportunities to recognise Australia's participation in various theatres of war.

3.15 Developer Contributions for Hard Infrastructure

Clause 6.2.6.1(f)(x) of TPS3 requires the Structure Plan report to explain the proposed method of implementation, including any cost sharing arrangements.

Developer contributions will be made based on the principles outlined in State Planning Policy 3.6. The key principle is that the beneficiary pays, meaning that the developer funds only the infrastructure and facilities which are reasonable and necessary for the development and to the extent that the infrastructure and facilities are necessary to service the development.

Development of CCW will generate traffic that, along with expected increases in regional traffic volumes (ie: traffic using the roads but not generated by this development) will result in the need to upgrade the intersection of Midgegooroo Road with Signal Terrace to a traffic light controlled intersection, and widening of Poletti Road to become a dual carriageway.

As explained in section 3.6, regional traffic movements will account for the majority of traffic volume on the affected roads, with the Integrated Facility and the balance of the CCW (residential, retail and commercial) contributing smaller volumes.

At a daily level the total development area in CCW is expected to contribute 20% of the projected Poletti Road flows with the Integrated Facility responsible for 12% and the remaining Cockburn Central at 8%. Regional movements will account for the remaining 80% of traffic.

In terms of the Midgegooroo Road/Signal Terrace intersection the development as a whole is expected to contribute 5% to the peak hour flows – the majority of which are related to Cockburn Central development (4%) with the Integrated Facility responsible for approximately 1% of the volumes. The remaining 95% of traffic using the intersection is expected to be regional movements.

It is intended that a proportional contribution will be made by the developer to upgrading the following infrastructure items:

1. The cost to upgrade the Signal Terrace and Midgegooroo Avenue intersection to become a traffic light controlled intersection. This includes:
    i. Land;
    ii. Preliminaries and detailed design;
    iii. Full earthworks and service relocations where required;
    iv. Pedestrian paths and infrastructure to provide for safe crossing of the intersection under lights;
    v. Stormwater management;
    vi. Lighting;
    vii. Landscaping.
2. Land which exists under the Structure Plan Area which is required for the Poletti Road upgrades designated under 3 below.
3. The cost to upgrade Poletti Road including all intersections. This includes:
    i. Preliminaries and detailed design;
    ii. Full earthworks and service relocations where required;
    iii. A road which comprises a divided carriageway with a 3.5m carriage in each; a 6m wide central median to provide for dedicated right hand turning lanes (may be flared in and out along the stretch of road); 1.5m beside carriage cycle lanes; a 2.5m shared path within the eastern verge only; .
    iv. Traffic and pedestrian controlled intersections at the northern and southern ends;
    v. Stormwater management;
    vi. Lighting;
    vii. Landscaping.

The exact amount of the contribution made by each party will be agreed between the City of Cockburn and LandCorp, based on the principle of proportionate contribution to the need for the hard infrastructure improvements.

3.16 Cockburn West Draft Wetland Concept

The CCW Structure Plan was conditionally adopted by the City of Cockburn on the 14 November 2013. Condition 2 of Council adoption was worded as follows *"The design and function of the retained wetland being to the satisfaction of Department of Parks and Wildlife and the City"*. In response to this condition the 'Cockburn West Draft Wetland Concept' was prepared by Urbis and submitted to the City of Cockburn (refer to **Appendix K**). The City is generally supportive of this draft concept subject to detailed landscape and wetland specification(s) being submitted at the subdivision and/ or development stage. This is to include discussion of a suitable maintenance period of the POS /Wetland post practical completion and also document the required long term management regimes by the City of Cockburn for the POS/Wetland, detailing particularly maintenance issues, revegetation programs, risk mitigation strategies and likely costs.

3.17 Pedestrian Investigation and Movement Plan

The CCW Structure Plan was conditionally adopted by the City of Cockburn on the 14 November 2013. Condition 6 of Council adoption was worded as follows:

"The preparation of a standalone Pedestrian Movement Plan including the analysis and investigation of a possible grade separation connection to the Cockburn Central Town Centre, to the satisfaction of the City."

In response to this condition the *Cockburn Central West Grade Separation Pedestrian Facility Investigation Plan December 2013* was prepared (refer to **Appendix L**). The City of Cockburn is generally supportive of this document, however the City will still pursue the formation of a future Cockburn Central Stakeholders Group, with key terms of reference to investigate and identify opportunities for improvement to pedestrian movement across the regional centre. The City's general support for this document does not prejudice any findings, recommendations or actions (whether local government or developer or both) which the future Cockburn Central Stakeholders Group may recommend.

4 Conclusion

The CCW Structure Plan provides planning guidance for the future subdivision and development of the site. The Structure Plan provides for the creation of a mixed use activity centre (with residential, retail and commercial uses) integrated with regional open space and recreational functions. It will form a seamless extension to the existing Cockburn Central Town Centre. The Structure Plan provides strong pedestrian and cycling linkages to the Town Centre and the surrounding locality.

A comprehensive design process has been undertaken that has resulted in a Structure Plan design that delivers the many elements (such as diversity, intensity, accessibility and employment) that creates a successful activity centre consistent with SPP 4.2. A key focus of the Structure Plan is the regional open space and the development of the Integrated Facility by the City of Cockburn.

The Structure Plan design has been influenced by the outcome of numerous technical investigations including a flora and fauna survey, transport assessment, local water management strategy and a servicing strategy and addendum. A key outcome from the investigation work is the combined location of the main drainage area and wetland in the central portion of the site. Many of the external roads will be widened and as such regular signalised crossing locations will be critical to the integration of the site with the Town Centre and the wider locality.

Part One of the report provides the requirements to ensure that the development within the site proceeds in accordance with the key outcomes from the Structure Plan. Part One also includes the built form principles that will guide the future development of the site and forms the basis of the future Design Guidelines.

These Guidelines will be prepared prior to any development of built form occurring on the site.

5. References

Environmental Protection Authority. 2006. Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986) - Level of Assessment for proposals Affecting Natural Areas within the System 6 region and Swan Coastal Plain Portion of the System 1 Region. No.10, June 2006. Environmental Protection Authority, Western Australia.

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COCKBURN CENTRAL WEST
STRUCTURE PLAN

FIGURES

Cardno
Shaping the Future

Figure 1: Location and Aerial Plan

Figure 2: Land Ownership Plan

Figure 3: Environmental Values and Structure Plan Overlay

Figure 4-7: Historical Aerial Photographs

Figure 8: Landform and Soils

Figure 9: Regional Context

Figure 10: Wetlands

Figure 11: Groundwater Levels

Figure 12: Acid Sulfate Soils

Figure 13: Indicative Building Layout

Figure 14: Public Open Space Plan

Figure 15: Context and Constraints Plan



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FIGURE 1 - LOCATION AERIAL PLAN

COCKBURN CENTRAL WEST

LANDCORP

NORTH

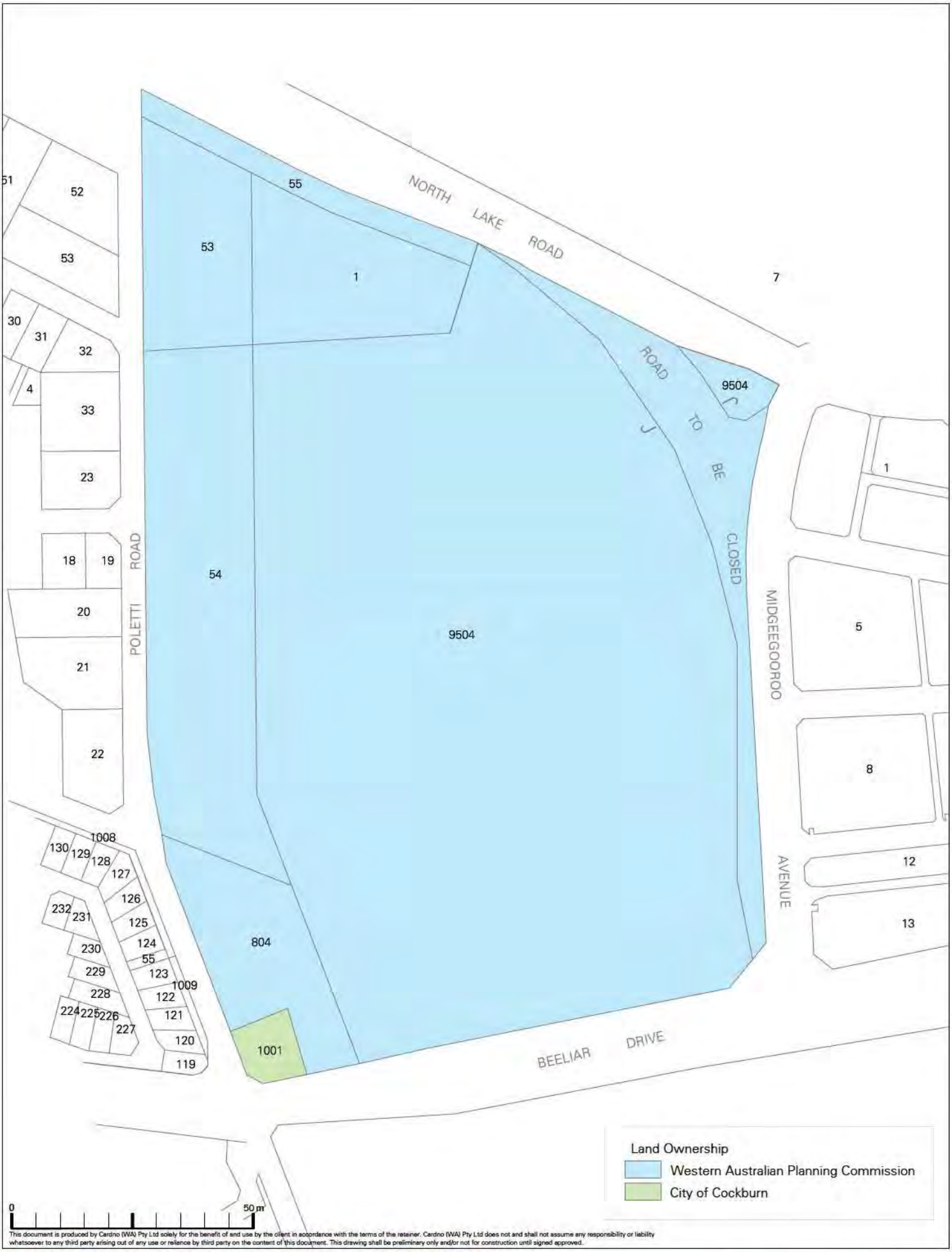
Cardno
11 Harvest Terrace
P.O. Box 447
West Perth 6872
Telephone (08) 9273 3888
Facsimile (08) 9486 8664

DATE:	19.06.2014	SCALE AT A4:	1:10,000
DESIGNED:	SB	CHECKED:	DM
DRAWN:	JC	APPROVED:	DM

LOCAL AUTHORITY
City of Cockburn

PROJECT PHASE PLAN NUMBER: P05002-002-FIG01

REVISION: B



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FIGURE 2 - LAND OWNERSHIP PLAN

COCKBURN CENTRAL WEST

LANDCORP

NORTH

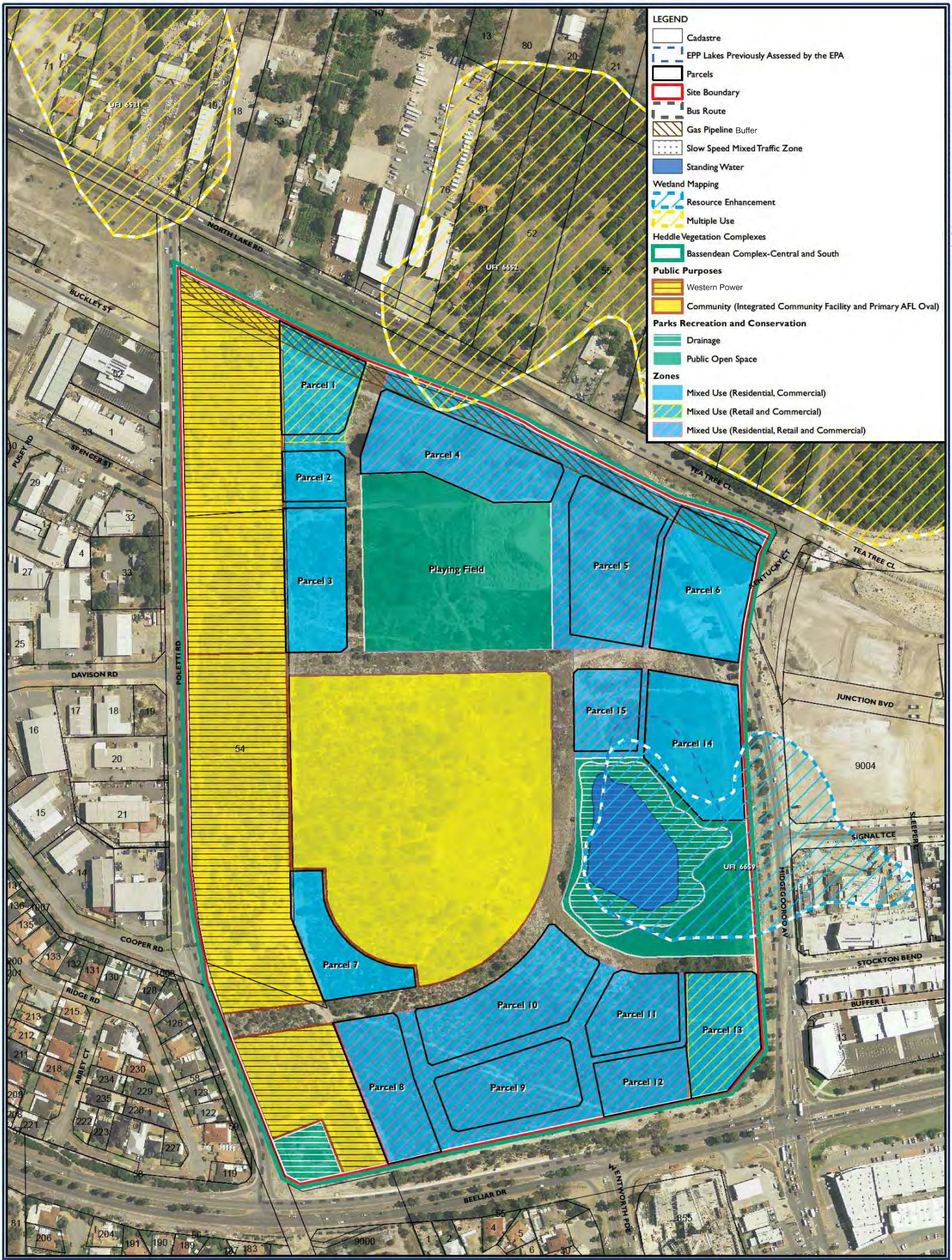
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11 Harvest Terrace
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LOCAL AUTHORITY
City of Cockburn

PROJECT-PHASE-PLAN NUMBER: P05002-002-FIG02

REVISION: B



RPS

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Drafted by: MA
Source: Cadastre, Orthophoto - Landgate, 2013. LSP - Cardno, 28.03.13 Wetlands - DEC, 2012 Heddle Vegetation Complexes - Heddle, Et.Al. - DEC, 1980 Structure Plan - Cardno 24.10.13

0 12.5 25 50 75 100 m

FIGURE 3
Structure Plan - Environmental Overlay

38 Station Street, Subiaco | T +61 8 9211 1111 | F +61 8 9211 1122 | www.rpsgroup.com.au

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 |www.rpsgroup.com.au



RPS

Job Number: L11457
Date: 04.05.12
Scale: 1:5000 @ A3
Version: A
Drafted by: HT
Source: Orthophoto - Landgate 2012.

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FIGURE 4 Historical Aerial

1965

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au



RPS

Job Number: L11457
Date: 04.05.12
Scale: 1:5000 @ A3
Version: A
Drafted by: HT
Source: Orthophoto - Landgate 2012.

0 25 50 100 150 200 m

FIGURE 5 Historical Aerial

1979

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 |www.rpsgroup.com.au



RPS

Job Number: L11457
Date: 04.05.12
Scale: 1:5000 @ A3
Version: A
Drafted by: HT
Source: Orthophoto - Landgate 2012.

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FIGURE 6 Historical Aerial

1985

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 |www.rpsgroup.com.au



RPS

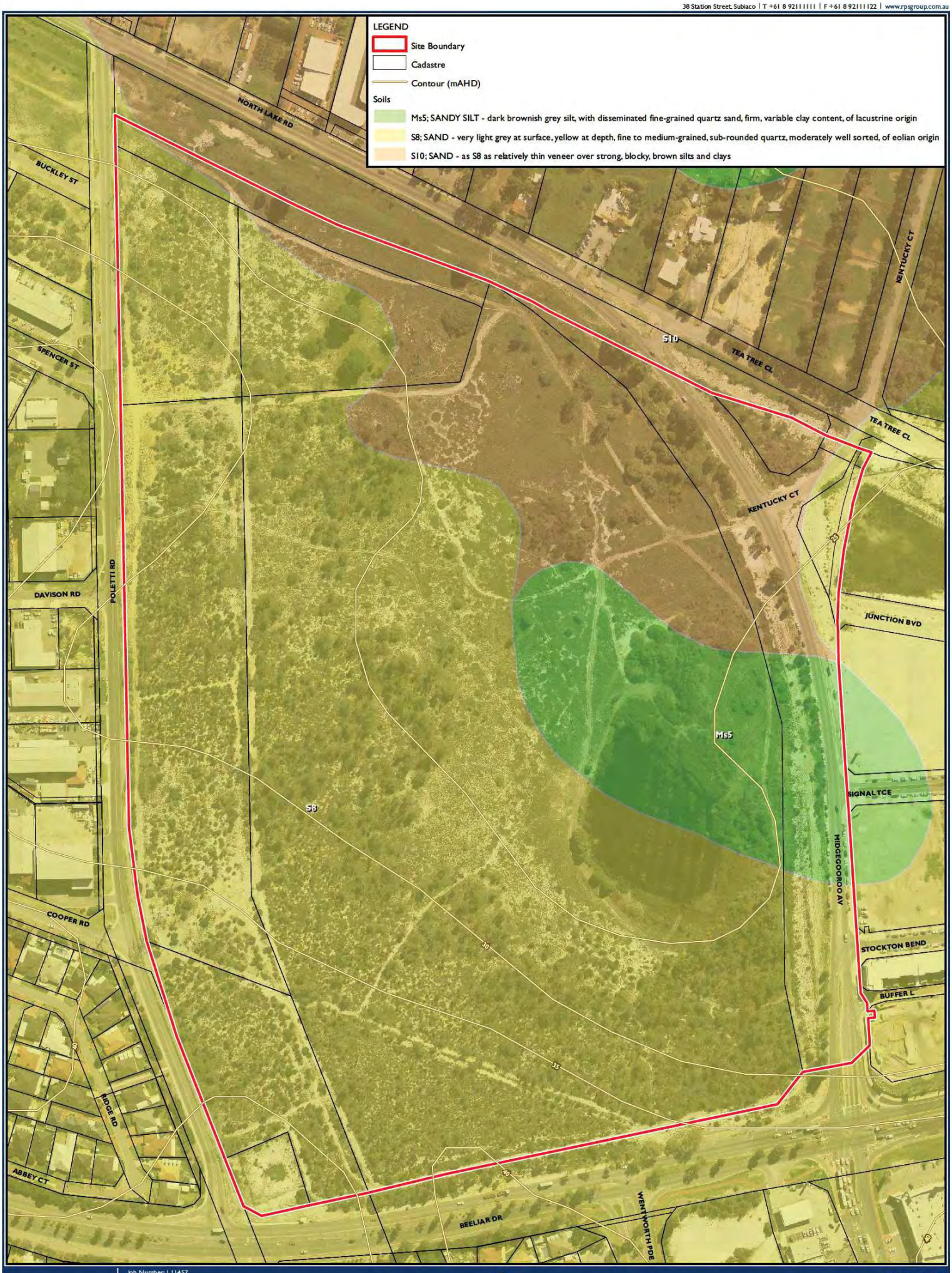
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Drafted by: HT
Source: Orthophoto - Landgate 2012.

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FIGURE 7 Historical Aerial

2004

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au



RPS

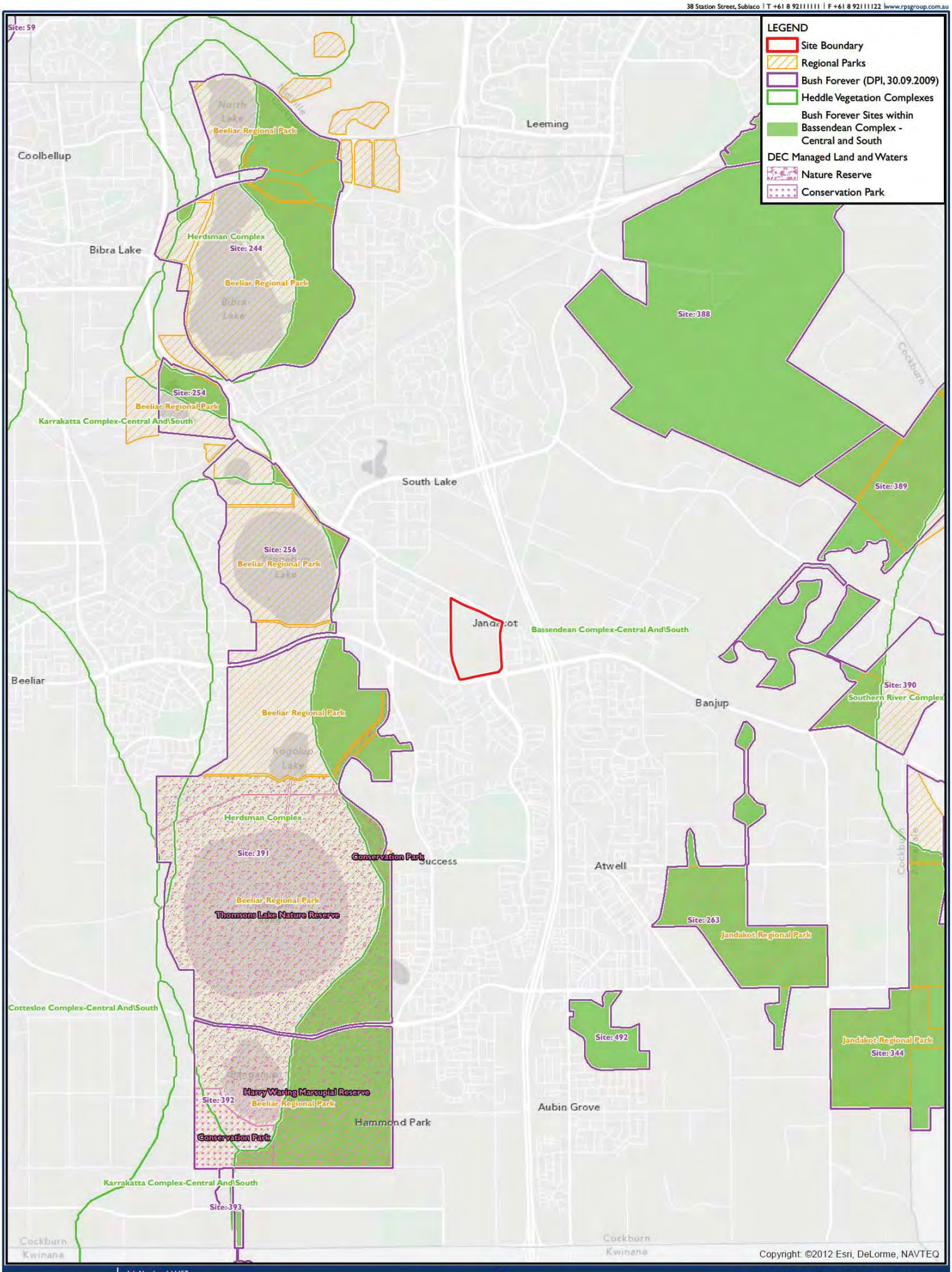
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0 12.5 25 50 75 100 m

FIGURE 8

Landform and Soils

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 www.rpsgroup.com.au



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RPS

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0 0.25 0.5 1 1.5 2 km

FIGURE 9 Regional Context – Bassendean Vegetation Complex – Central and South

38 Station Street, Subiaco | T +61 8 92111111 | F +61 8 92111122 | www.rpsgroup.com.au



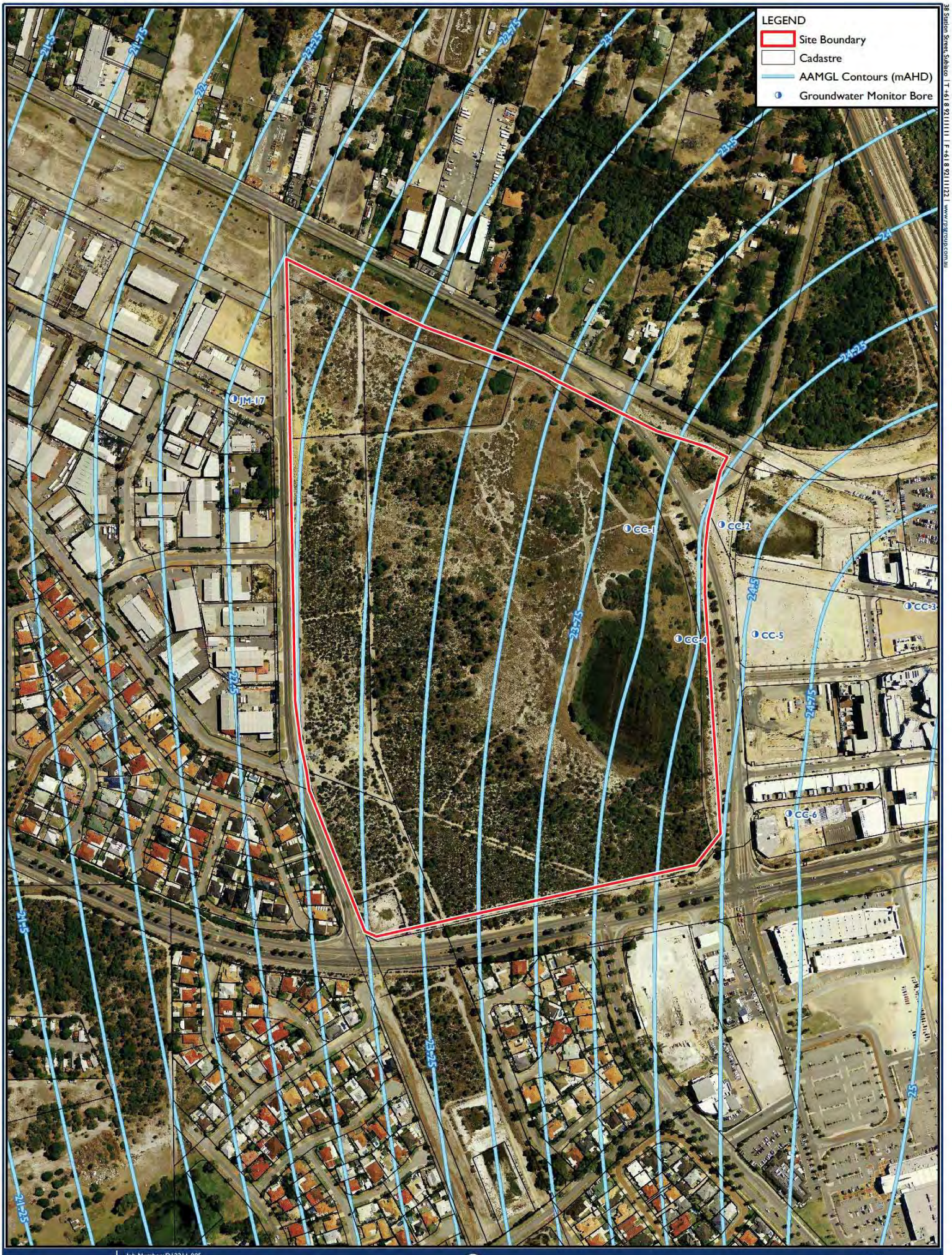
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Version: A
Drafted by: HT
Source: Cadastre & Orthophoto - Landgate, 2011. Wetlands - DEC 2011, EPP Lakes, DEC 1992

0 15 30 60 90 120 m

FIGURE 10

Wetlands



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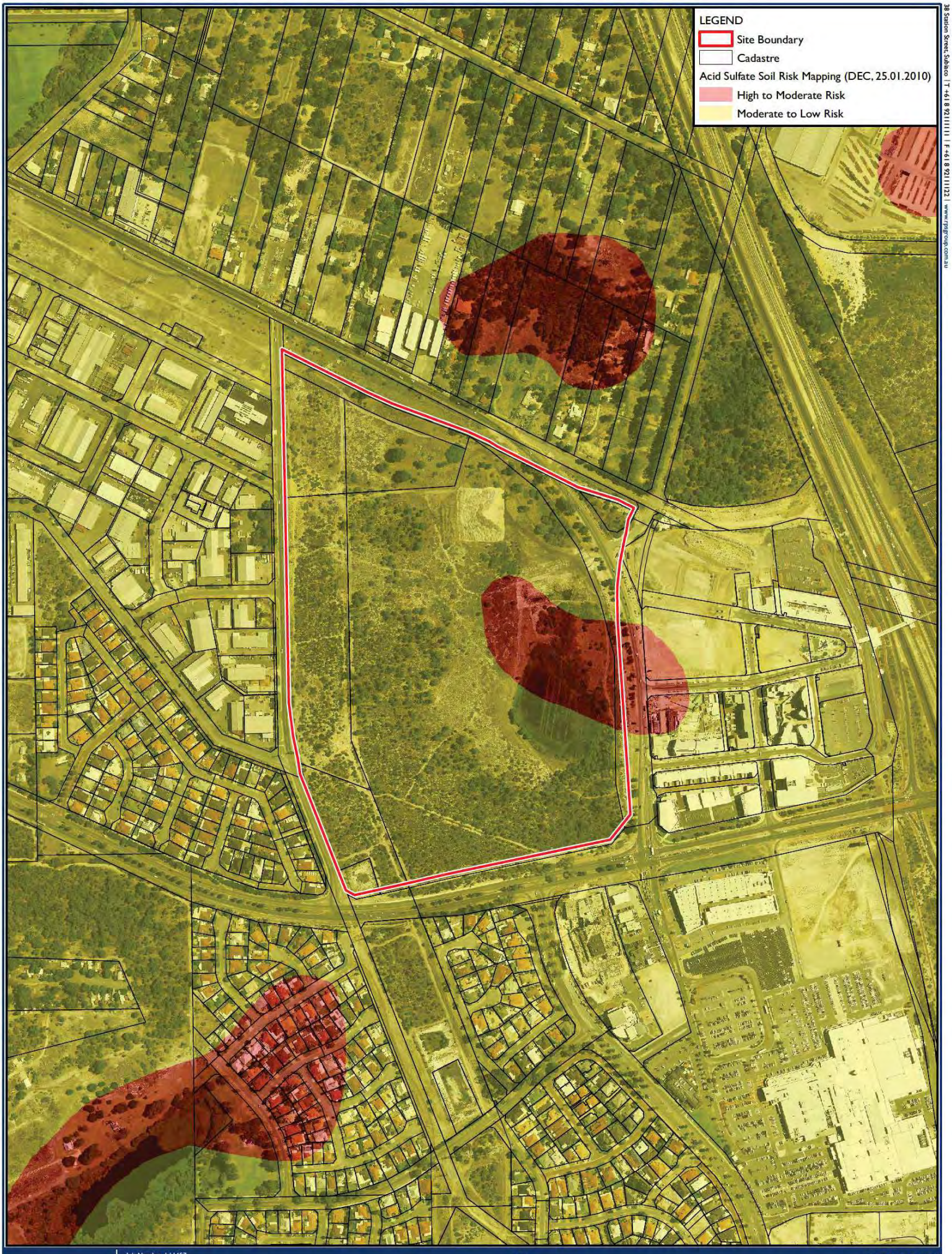
RPS

Job Number: D12211-005
Date: 05.04.13
Scale: 1:4,000 @ A3
Revision: A
Created by: HT
Source: Cadastre - Landgate, 2012 Orthophoto - Landgate, 2012

GDA 1994 MGA Zone 50

0 25 50 100 150 200 metres

FIGURE 11
Groundwater Monitoring Locations and AAMGL Contours



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RPS

Job Number: L11457
Date: 01.05.13
Scale: 1:1500 @ A3
Revision: 0
Created MA
Source: Cadastre, Orthophoto - Landgate, 2013 ASS Mapping DEC, 2010

0 37.5 75 150 225 300 m

FIGURE 12

Acid Sulfate Soils Risk Mapping



FIGURE 13 - Indicative Building Layout



FIGURE 14 - PUBLIC OPEN SPACE

COCKBURN CENTRAL WEST

LANDCORP

NORTH

job no. 117055/032	designed MB
date 23/08/2016	checked MB
scale 1:2,500	drawn NM

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Revision D

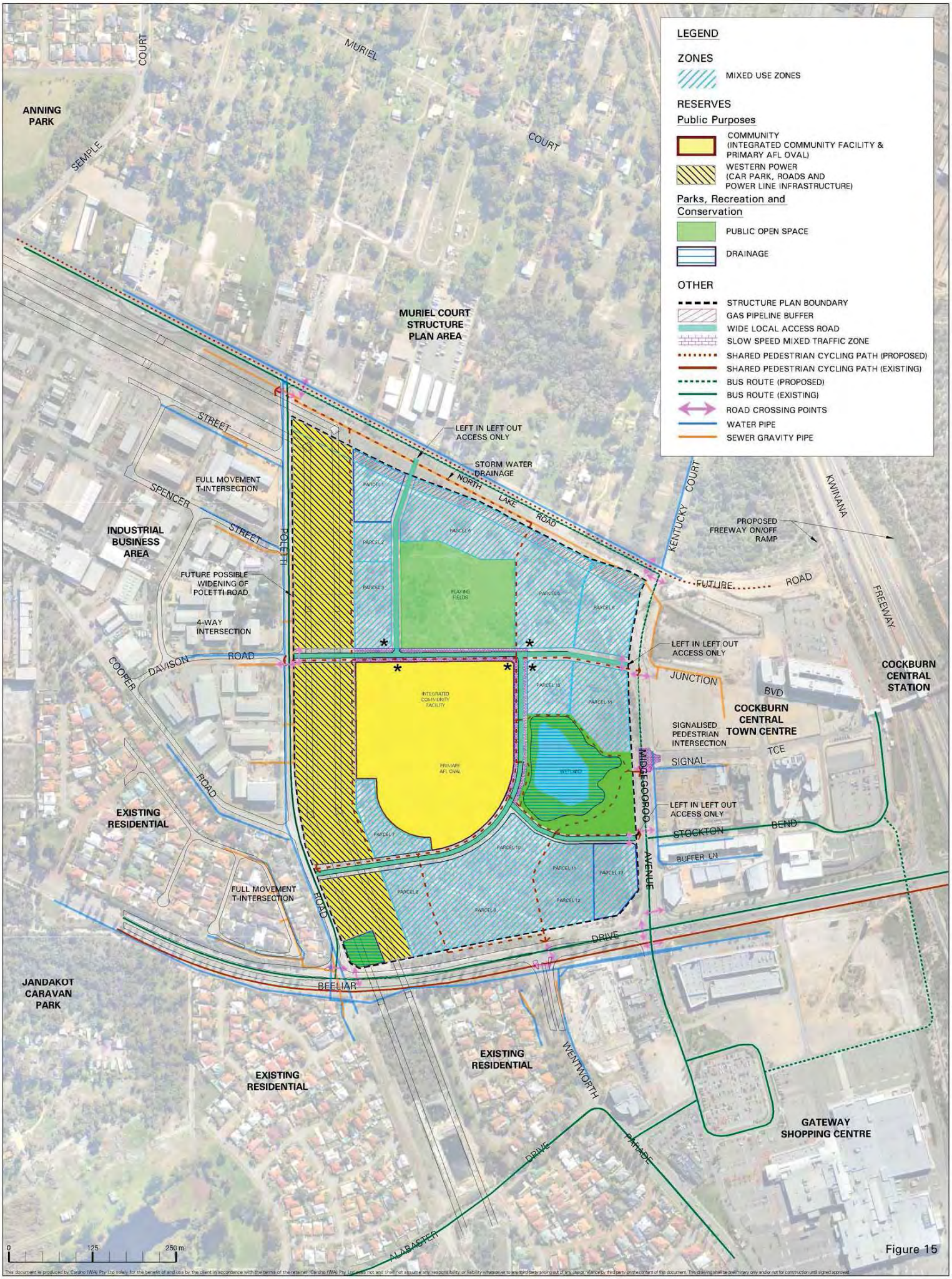


Figure 15

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FIGURE 15 - CONTEXT AND CONSTRAINTS PLAN

COCKBURN CENTRAL WEST

LANDCORP

Cardno
11 Harvest Terrace
P.O. Box 447
West Perth 6872
Telephone (08) 9273 3888
Facsimile (08) 9486 8664

DATE:	19.06.14	SCALE AT A3:	1:5000
DESIGNED:	SB	CHECKED:	DM
DRAWN:	JC	APPROVED:	DM

LOCAL AUTHORITY
CITY OF COCKBURN
PROJECT-PHASE-PLAN NUMBER: P5002 - FIG15
REVISION: C

About Cardno

Cardno is an ASX200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company, listed on the Australian Securities Exchange [ASX: CDD].

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