

BALDIVIS (NORTH) □ DISTRICT STRUCTURE PLAN

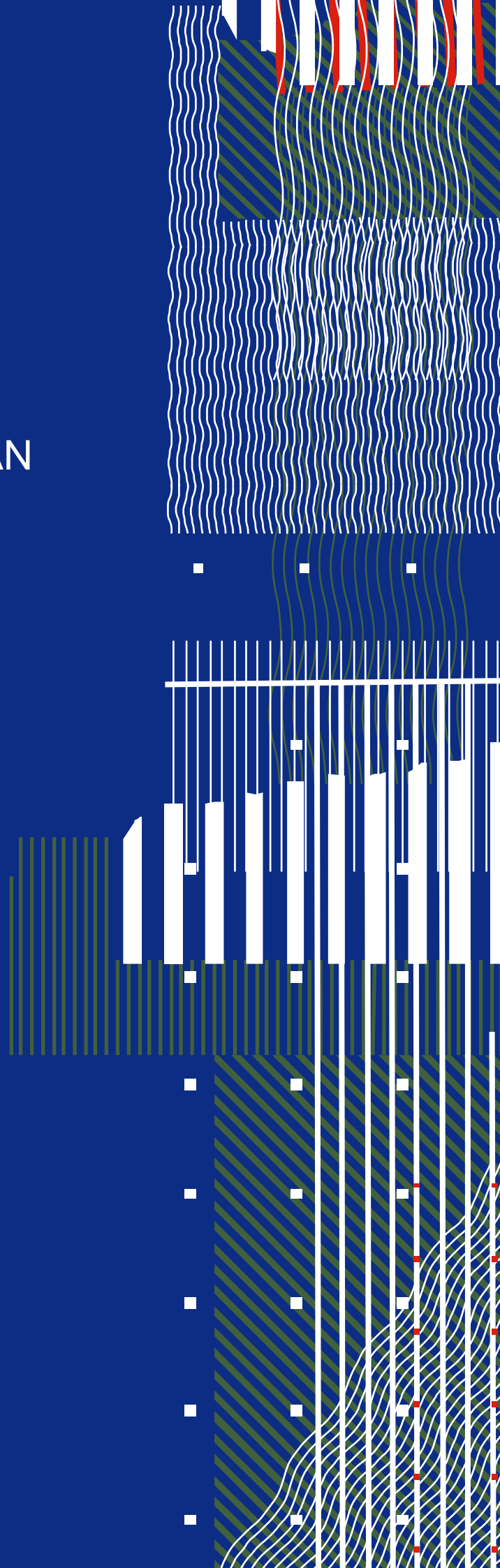
Prepared for: CITY OF ROCKINGHAM

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BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN

JULY 2000

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EXECUTIVE SUMMARY

Introduction

The City of Rockingham commissioned the preparation of a District Structure Plan for the proposed urban areas of Baldivis located north of Safety Bay Road. The Structure Plan area includes all the 'Urban' and 'Urban Deferred' zoned land located within Kerosene Lane, Baldivis Road, Safety Bay Road and Mandurah Road. The study area is referred to as Baldivis (North).

The need for the preparation of the study arose from the situation of fragmented land ownership and the need for a coordinated and comprehensive development proposal to be drafted. Most land within the study area has been zoned 'Urban' or 'Urban Deferred' since 1994 but as yet has remained undeveloped. The primary objective of the study is to provide a district level structure plan which provides a framework and sets out the principles for the residential and urban development of the area. The District Structure Plan provides a basis from which more detailed Comprehensive Development Plans (CDP's) are to be drafted as the landowner wished to proceed with urban development. The timing of development is a decision which rests with the landowner.

In order to coordinate the funding of such development, Council also commissioned the preparation of a study to consider the most appropriate infrastructure cost sharing mechanism as a means to assist in the orderly and equitable cost sharing provision of essential infrastructure for the development of Baldivis (North). The study outcomes are provided under a separate report titled Development Coordination Mechanisms - Overview Report (Taylor Burrell 2000).

The study area was broken up into three precincts to assist in the easier application of infrastructure cost sharing arrangements. The District Structure Plan was prepared by a team consisting of town planning, engineering and environmental consultants in consultation with the City of Rockingham and the feedback received from the landowners within the study area during the community consultation phases.

Background Analysis

The study examined the existing planning situation and acknowledged the various Comprehensive Development Plans that had been lodged with the City of Rockingham.

A detailed environmental analysis was undertaken which addressed matters relating to soils, geology, wetlands, groundwater, vegetation complexes and condition, remnant vegetation, declared rare and priority flora and fauna.

A number of particular environmental issues and Policies were identified which have implications on the development of the area. The most critical of these being the CMS Parmelia Pipeline buffers and the poultry and market gardens buffers.

CMS Parmelia Pipeline Buffers

The CMS Pipeline is protected by two buffers which restrict certain levels of development. No residential development may be permitted within 32 metres either side of the CMS Pipeline. No use where large numbers of people may congregate may be located within 96 metres either side of the pipeline.

Market Garden & Poultry Farm Buffers

Most of the study area falls within the Department of Environmental Protection's 500 metre residential buffer requirements. Consideration to staging of development needs to be given in this respect.

A context analysis was undertaken which identified the context of the study area:

- within the existing built environment
- within the existing natural environment
- in terms of regional level strategic planning undertaken to date
- in terms of local level strategic planning undertaken to date

A public Enquiry By Design workshop was held in which all owners of land within the study area were invited to attend. The purpose of the workshop was to inform land owners as to the identifiable constraints and opportunities on the development of the area and to invite feedback on issues or design aspirations. Three key issues were raised in the workshop, being:

- recognition of Baldivis Primary school as the main community focal point for the study area
- preference for the neighbourhood centre to be located on or near the intersection of Nairn Drive and Fifty Road
- desire to relocate Nairn Drive. This suggestion however was not adopted for various reasons as outlined in the report.

An examination was undertaken of the existing utility services in the area and an assessment as to the required extensions and upgradings to facilitate the development of the study area.

District Structure Plan

Design Principles

The Plan has been designed with regard to the principles of the Liveable Neighbourhood Community Design Codes to promote the use of the Codes in the preparation of individual detailed Comprehensive Development Plans. The main focal point for the Baldivis (North) community will be the neighbourhood centre proposed central to the structure plan area. Walkable Catchment Nodes have also been identified promoting development focussed around local 'villages'. The Walkable Catchment Nodes allows corner store style retail development up to 150m² floorspace or a localised community use.

Transport Network

The Plan adopts a grid pattern of neighbourhood roads within the existing road network.

The road network has been designed to optimise connectivity within the study area and to allow ease of access to connector roads linking the study area with Rockingham and the proposed freeway (extension) to the east. The Plan utilises all existing constructed roads. The road design allows for the introduction of bus routes for both local and commuter purposes.

Residential Density and Yield

The development of Baldivis (North) in accordance with the District Structure Plan is envisaged to accommodate 4290 lots which will generate a total population of 11,580 people.

Neighbourhood Centre

The potential population of Baldivis (North) generates the need for a neighbourhood level shopping centre. The neighbourhood centre is strategically positioned at the intersection of Nairn Drive (a district distributor road) and Fifty Road (a neighbourhood connector) which is central to all residents within Baldivis (North).

Primary Schools

The population yield generates the need for two primary schools within the study area. The Education Department has confirmed that 'the existing Baldivis Primary School will remain in its current site and that one additional primary school will be required in this area'.

The position of the additional school has been proposed in the north west precinct as residents within the southern precinct will have the opportunity to access a proposed primary school to the south of Safety Bay Road.

Public Open Space

The Plan provides a self contained 10% minimum provision of Public Open Space within each Precinct area. All parcels of Public Open Space contain areas 5000m² or greater in accordance with Council's Public Open Space Policy.

The existing open space area adjoining Baldivis Primary school has been credited as part of the 10% provision. The provision has been allocated on a proportional (area) basis between each of the three Precincts. The CMS Pipeline 32m buffer area if developed and/or landscaped for recreation purposes will be given a 50% credit towards the public open space contribution.

Implementation

In order for residential development to occur within Baldivis (North) the following planning processes still need to be achieved:

- rezoning from "Urban Deferred" to "Urban" under the Metropolitan Region Scheme (where applicable);
- rezoning from "Rural" to "Development Zone" under the City of Rockingham Town Planning Scheme No. 1
- preparation and approval of individual Comprehensive Development Plan that is in accordance with the principles identified in the District Structure Plan;
- preparation and approval of individual subdivision application which is generally consistent with the approved Comprehensive Development Plan.

Infrastructure Cost Sharing

In view of the fragmented land ownership within much of the Structure Plan area, it is difficult to distribute community infrastructure in a way that all owners are equally affected. Council has considered the implementation of a mechanism to share the cost of infrastructure provision equitably between all landowners through developer contributions.

Whichever method is ultimately adopted, it will be necessary to determine the requirement for, and cost of, the provision of community infrastructure, so that such requirements and costs can be distributed among landowners/developers in a fair and equitable manner.

Council has commenced action on the preparation of infrastructure cost sharing provision suitable for application in Baldivis (North). It will be necessary to undertake a more detailed assessment of servicing requirements and land requirements for community infrastructure such as public open space, which can then be translated into cost estimates.

JULY 2000

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1.0 INTRODUCTION

The City of Rockingham commissioned the preparation of a District Structure Plan for the proposed urban areas of Baldivis located north of Safety Bay Road. The Structure Plan area includes all the 'Urban' and 'Urban Deferred' zoned land located within Kerosene Lane, Baldivis Road, Safety Bay Road and Mandurah Road. The study area is referred to as Baldivis (North).

Land within the study area has been zoned Urban or Urban Deferred since 1994, but has yet to be developed.

The need for the preparation of the study arose from the situation of fragmented land ownership and the need for a coordinated and comprehensive development proposal to be drafted. Most land within the study area has been zoned 'Urban' or 'Urban Deferred' since 1994 but as yet has remained undeveloped. The primary objective of the study is to provide a district level structure plan which provides a framework and sets out the principles for the residential and urban development of the area. The District Structure Plan provides a basis from which more detailed Comprehensive Development Plans (CDP's) are to be drafted as a landowner wishes to proceed with urban development. The timing of development is a decision which rests with the landowner.

While the land is zoned, the City of Rockingham has been reluctant to support adhoc subdivision development proposals without an overall structure plan and without a development infrastructure cost sharing proposal being in place to ensure equitable distribution of costs to those landowners.

In order to coordinate the funding of such development, Council also commissioned the preparation of a study to consider the most appropriate infrastructure cost sharing mechanism as a means to assist in the orderly and equitable cost sharing provision of essential infrastructure for the development of Baldivis (North). The study outcomes are provided under a separate report titled Development Coordination Mechanisms - Overview Report (Taylor Burrell 2000). The study brings together the numerous types of mechanisms that have been prepared by Local Government or private landowners in recent times, and identifies the common principles and objectives which should form the basis for any such process. These principles and objectives have been used by Council as a basis for preparing cost sharing provisions suitable for application in Baldivis (North).

The study area was broken up into three precincts to assist in the easier application of infrastructure cost sharing arrangements. The District Structure Plan was prepared by a team consisting of town planning, engineering and environmental consultants in consultation with the City of Rockingham and the feedback received from the landowners within the study area during the community consultation phases.

The Study area and precincts area shown in **Figure 1**.

1.1 Study Methods and Objectives

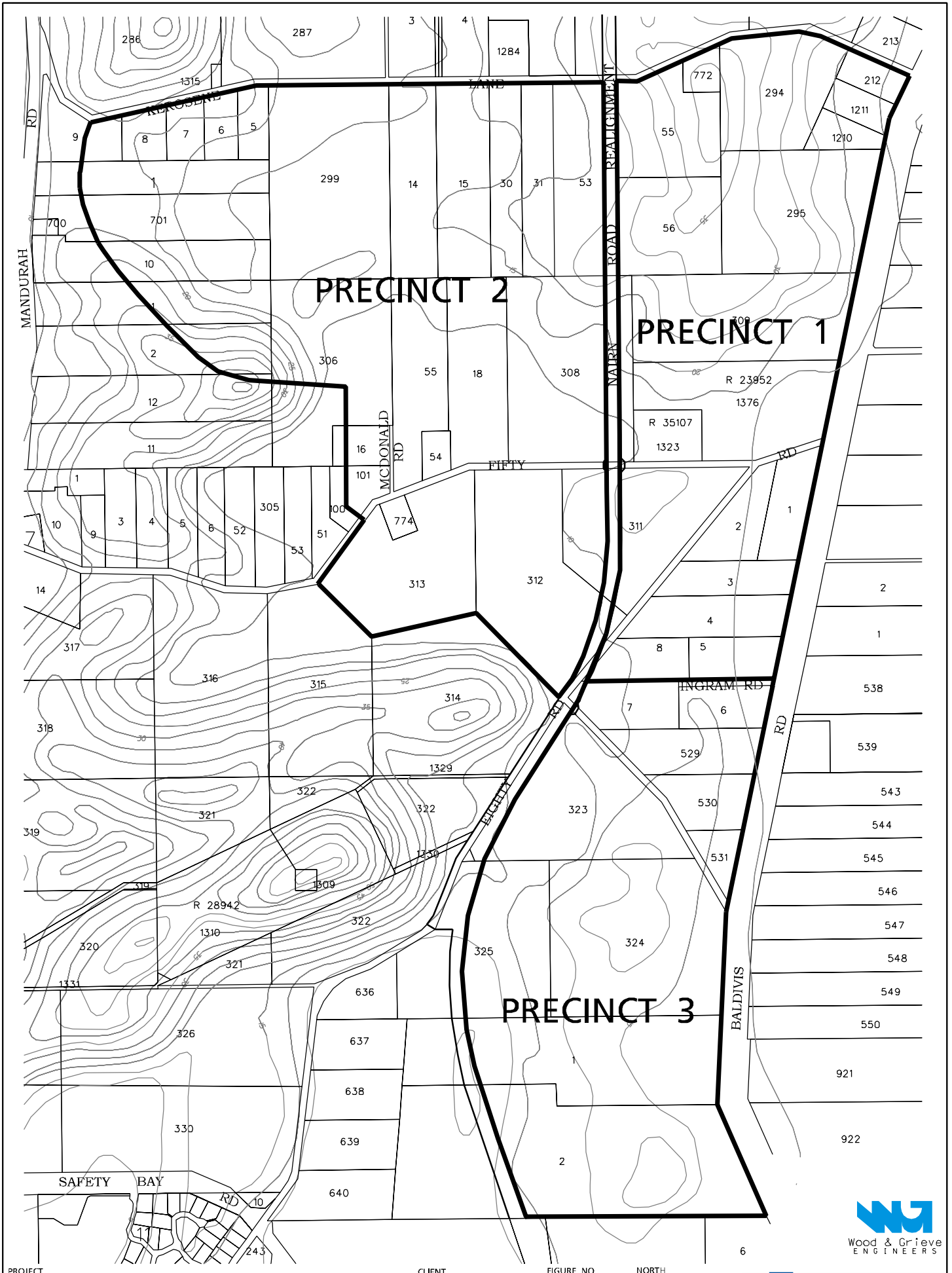
The Study Brief required the preparation of a District Structure Plan to guide the future urbanisation of Baldivis (North). The District Structure Plan has been prepared having regard to:

- physical and environmental site assessment;
- current practices and philosophies in urban planning, in particular Liveable Neighbourhoods – Community Design Code;
- WA Planning Commission policies and requirements;
- planning requirements of the City of Rockingham;
- requirements of State Government agencies;
- previous structure planning undertaken over various landholdings within the District Structure Plan area;
- aspirations of land owners.

The formulation of the District Structure Plan included public consultation where a workshop was held to allow landowners to express their aspirations for the development of their land.

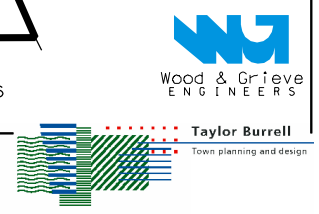
The objectives of the District Structure Plan are to:

- establish a framework for the location of major land uses, district and regional level road network and district level drainage requirements;



STUDY AREA - PRECINCT PLAN
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN

PROJECT: City of Rockingham CLIENT: City of Rockingham FIGURE NO.: 1 NORTH: 



- respect the identified physical environmental opportunities and constraints of the land and its surrounding context;
- reflect the objectives and aspirations of the local community;
- ensure that landowners are dealt with in an equitable manner in terms of the provision of community infrastructure such as roads, schools, parkland and other community facilities;
- provide a district level framework incorporating orderly and proper planning upon which more localised Comprehensive Development Plans are to be prepared.

1.2 Study Team

The Study Team comprised:

- **Taylor Burrell Town planning and design**
as project coordinators and town planners
- **Bowman Bishaw Gorham Environmental Consultants**
expert advice into environmental assessment and implications of environmental policies
- **Wood and Grieve Engineering Consultants**
analysis of servicing and expert advice on road design

2.0 PLANNING BACKGROUND

2.1 Metropolitan Region Scheme Zoning

The whole of the Structure Plan area is either zoned "Urban" or "Urban Deferred" under the Metropolitan Region Scheme (MRS). There are three areas, which are zoned "Urban Deferred", two of which fall within 500m buffers of existing poultry farms (**Figure 2**).

The Nairn Drive alignment is reserved as an Important Regional Road and Mandurah Road to the west of the Structure Plan area is reserved as Other Major Highway. A large area of land to the west of the Structure Plan area encompassing Lake Cooloongup and Lake Walyungup, is reserved as Regional Open Space.

2.2 Local Authority Zoning

The Structure Plan area is subject to the provisions of the City of Rockingham Town Planning Scheme No. 1. The zonings applying to the area under that Scheme are shown in **Figure 3**.

There are two areas zoned "Development". One area includes three lots located near the north-east corner (Precinct 1) and reflects that area, which is the subject of an approved Comprehensive Development Plan. This land lies immediately north of a Public Open Space Reserve and a Public Purposes site, which contains the existing Baldivis Primary School. The second area includes Lots 1 and 2 Baldivis Road in the south of the Structure Plan area.

Nairn Drive, in accordance with the Metropolitan Region Scheme, is reserved as Important Regional Road. All other land within the Structure Plan area is zoned "Rural".

2.3 Metroplan

METROPLAN is a State Government initiative which was released by the former Department of Planning and Urban Development (DPUD) in 1990 to guide the direction of Perth's major growth areas until the year 2021. Essentially, it is a Metropolitan Strategy which sets broad parameters for the direction urban growth should take. METROPLAN also provided an implementation framework to ensure its recommendations were realised.

The Baldivis (North) District Structure Plan area is contained within a major growth area identified in METROPLAN as 'future urban' located between the lakes system (Cooloongup and Walyungup) and the Kwinana Freeway extension. METROPLAN provided a significant change to the Corridor Plan (1970), which had recognised this area as remaining as a rural wedge suitable for horticultural purposes.

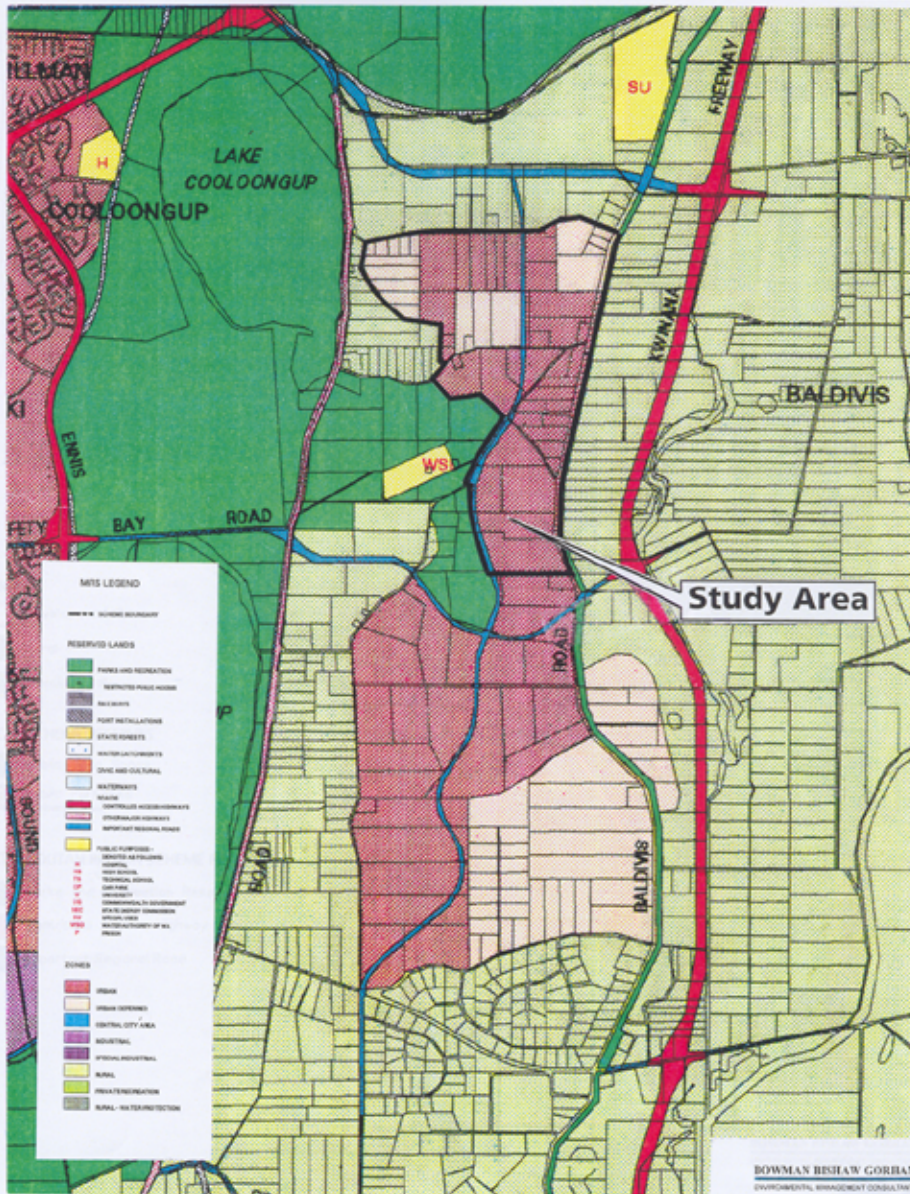
2.4 Urban Expansion Policy Statement

The Urban Expansion Policy Statement released in 1990 by the DPUD identified in more specific detail than Metroplan, the most suitable areas to accommodate Perth's population growth.

The Structure Plan area is situated within a large area designated under the Policy Statement as Land Suitable for Urban Development under the identified Urban Expansion Areas.

2.5 South West Corridor Structure Plan

The South West Corridor Structure Plan was released by (DPUD) in 1993 and provides a framework identifying the future urban development areas of the corridor. The Structure Plan also considered the location and hierarchy of regional and district retail centres, major employment areas, proposals for regional open space and regional roads. The Structure Plan serves as a link in the planning process as required by Metroplan to provide a guide and rationale to the preparation of major amendments to the MRS.



BOWMAN BISHAW GORHAM
 ENVIRONMENTAL, MANAGEMENT CONSULTANTS

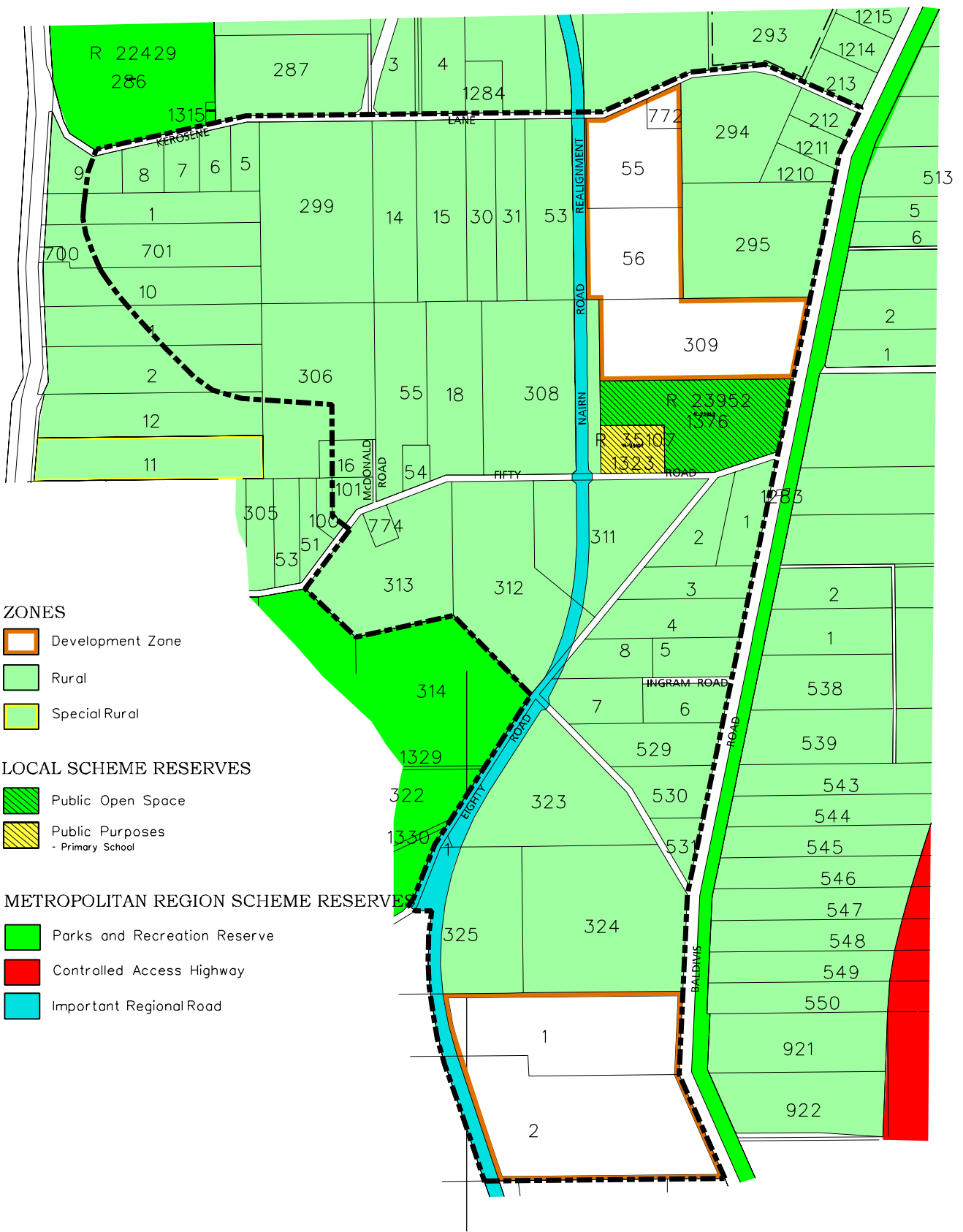


Wood & Grieve
 ENGINEERS



Taylor Bunell
 ENGINEERS










ZONES

-  Development Zone
-  Rural
-  Special Rural

LOCAL SCHEME RESERVES

-  Public Open Space
-  Public Purposes - Primary School

METROPOLITAN REGION SCHEME RESERVES

-  Parks and Recreation Reserve
-  Controlled Access Highway
-  Important Regional Road

The South West Corridor Structure Plan identified different categories of urban development capabilities. Category A1 is land assessed as having no constraints to urban development. Category B is regarded as land with major constraints but may become available for urban development prior to 2021.

The Structure Plan identifies all of Precinct 3 of the Baldvis (North) District Structure Plan as "Category A1 Future Urban" and all of Precinct 2 as "Category B Future Urban" recognising the existing market gardens as a constraint to development. The western boundary of the Category B area of Precinct 2 was defined by the objectives of protecting the rural viewshed provided by the ridgeline east of Mandurah Road and to prevent residential housing within the area prone to midge nuisance from Lakes Cooloongup and Walyungup. The area to the west of this boundary remains Rural under the Metropolitan Region Scheme. The area north of Fifty Road in Precinct 1 is identified as Category B Future Urban and the area to the south as Category A1 Future Urban.

The issues regarding constraints were discussed in Working Paper No. 5 (1993)- A Review of the Constraints to Urbanisation. Market gardening was recognised as a constraint but observations were made that market gardening in the area of north Baldvis had not developed in the area to the degree as envisaged in the Corridor Plan. This was largely due to the limitations imposed on ground water extraction. The issue of market gardens and its implication to the Baldvis (North) District Structure Plan is discussed in more detail in Sections 3.5.2 and 3.5.3.

2.6 South-West Corridor Stage B Amendment 937/33 and Omnibus Amendment 960/33.

In 1993 a Major Amendment (937/33) known as 'South West Corridor Stage B' was initiated to give statutory affect to the proposals under the South West Corridor Structure Plan. The Amendment proposed to introduce the proposed Nairn Drive as an Important Regional Road reservation and the area bounded by the Nairn Drive alignment, Fifty Road, Baldvis Road and north of Safety Bay Road was proposed as Urban. The amendment was ultimately gazetted in 1994.

A further Omnibus Amendment (960/33) was initiated in 1994 and proposed to zone the Baldvis area (north of Fifty Road) as Urban Deferred. A number of submissions were received from landowners confirming their support for full urban zoning. Other submissions were received by operators of market gardens and poultry farms seeking short to medium term protection of their pursuits. It was considered by the then State Planning Commission that some measure of protection should be provided to these operators and the following conclusion was resolved "*... the amendment should be modified to zone Urban all the land other than that most directly affected by the poultry farms and the subject of objections in the eastern portion, which should remain Urban Deferred...*".

Accordingly, the amendment was modified to reflect the Commission's resolution and gazetted in that form.

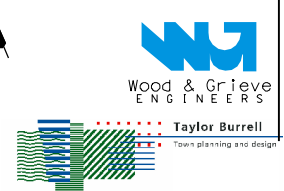
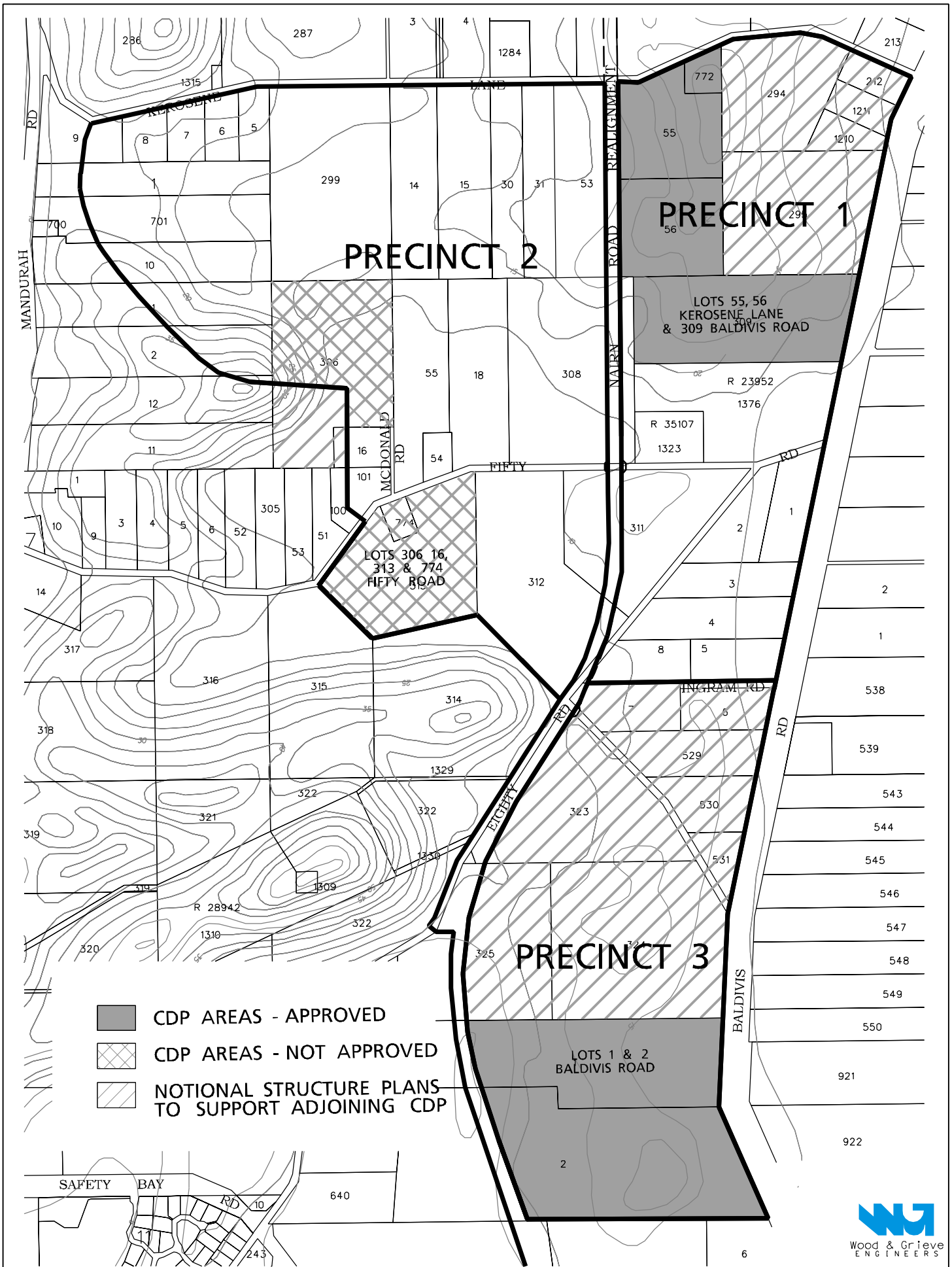
2.7 Local Structure Planning

The study area has been the subject of a number of local structure planning proposals (formally referred to as Comprehensive Development Plans) prepared for individual landowners or landowner groups which are relevant to varying degrees, to the formulation of the District Structure Plan. The landholdings over which such structure planning has been undertaken are identified in **Figure 4** and described below.

2.7.1 Hamilton Downs Pty Ltd – Lots 55, 56 and 772 Kerosene Lane and Lot 309 Baldvis Road, Feilman - Planning Consultants

A Comprehensive Development Plan (CDP) for the Baldvis area north of Fifty Road was prepared by Feilman Planning Consultants on behalf of Hamilton Downs in support of residential development of its 8.9ha landholding north of the Baldvis Primary School and adjoining Public Open Space reserve.

The City of Rockingham approved a CDP over Lots 55, 56 and 72 Kerosene Lane and Lot 309 Baldvis Road in August 1997 subject to a 500m buffer to the existing poultry farm on Lot 308 Fifty Road being maintained in accordance with the Environmental Protection Authority Code of Practice – Poultry Farms.



The WA Planning Commission considered a subdivision over Lot 309 Baldvis Road and granted approval to the eastern half not affected by the 500m poultry farm buffer. The area of approval contains 80 residential lots and a public open space area. A reconsideration request was lodged with the WA Planning Commission to seek a reduction to the buffer area to allow subdivision of the western portion. The WA Planning Commission is awaiting receipt of a dynamic olfactometry assessment before it will formally consider the matter.

2.7.2 Pt Lot 306, Lots 16, 313 and 774 Fifty Roads - Urban Focus

A request to rezone Pt Lot 306, Lots 16, 313 and 774 Fifty Roads to 'Development Zone' together with a supportive CDP was considered by the City of Rockingham in 1997. The request included some land zoned Rural under the MRS. The Council resolved not to initiate a rezoning until a number of matters were addressed including the revision of the CDP to only include land zoned Urban under the MRS.

A revised CDP was considered by Council in late 1997 where Council resolved to amend its Scheme (A300) to rezone the MRS, Urban zoned areas from 'Rural' to 'Development Zone'. The Council refused to consider the CDP until the matter of use of the former WANG Gas Pipeline (now CMS Gas Transmission Australia) easement and buffer for public open space was determined following a Quantitative Risk Assessment.

At the time of writing no further consideration of the CDP had been given by Council. The design provided by Urban Focus over the subject lots has been acknowledged in the preparation of the Baldvis (North) District Structure Plan.

2.7.3 Karinya Pty Ltd, Dalacen Pty Ltd and Benara Nominees Pty Ltd - Lots 1 and 2 Baldvis Road - Mitchell Goff and Associates

A Comprehensive Development Plan was lodged with the City of Rockingham in 1995 proposing essentially residential development over a 44ha area of Lots 1 and 2 (east of the CMS pipeline) together with a request to rezone the land from 'Rural' to "Development Zone". The Council initiated an amendment (A271) to rezone the subject land to 'Development Zone' and required a number of modifications to the CDP prior to it adopting the Amendment for final approval. A significant modification was the creation of a central community focus incorporating public open space.

In July 1997 a revised CDP was considered by the Council where it resolved to defer consideration until various matters were resolved including, location of public open space to the north of the site to enable retention of a significant stand of trees, land use liability claims over the (former) WANG pipeline easement and buffer, location of public open space and its acceptance as part of 10% contribution, over the WANG easement and buffer and other minor matters.

A revised CDP had been approved at the late stage of the formulation of this document with the design reflecting the principles as provided by the Baldvis (North) District Structure Plan.

3.0 EXISTING ENVIRONMENT

3.1 Location

The land subject of the District Structure Plan includes all of the land zoned "Urban" or "Urban Deferred" under the MRS that lies between Mandurah Road to the west, Kerosene Lane to the north, Baldivis Road to the east, and the northern boundary of the Baldivis District Centre to the south. The area is located approximately 38km south-west of the Perth Central Business District and approximately 9km east-south-east of the Rockingham Town Centre.

A list of people or companies who own land within the Structure Plan area is provided in **Appendix 1**.

3.2 Physical Environment

3.2.1 Topography

The topography of the study area is dominated by two hills; in the west a conical crest at 50m AHD elevation and in the north-east a hill at 42m AHD. Two lower hills (20m AHD) occur in the south of the study area, whilst the remainder may be described as gently undulating. The lowest elevations are associated with the limited occurrence of wetland depressions.

3.2.2 Geology and Soils

The study area is located within the Spearwood Dune system, described as dune ridges with deep siliceous yellow brown sand and limestone, lower slopes with moderately deep to deep siliceous sands (van Gool, 1990).

Geological units over the study area are described by Gozzard (1983) as limestone, sand, sandy clay, peaty clay, and silt. The location of each geological unit is shown in **Figure 5**.

The study area consists predominantly of limestone formation (LS1, overlain by a veneer of sand) in the west and east, and pale yellowish brown sands (S7) and yellow sands (S8) in the central and southern areas. A small area of sandy clay (CS1) corresponds to Tamworth Hill Swamp. Two very small areas of peaty clay (Cps, small wetland) and silt (M4) also occur.

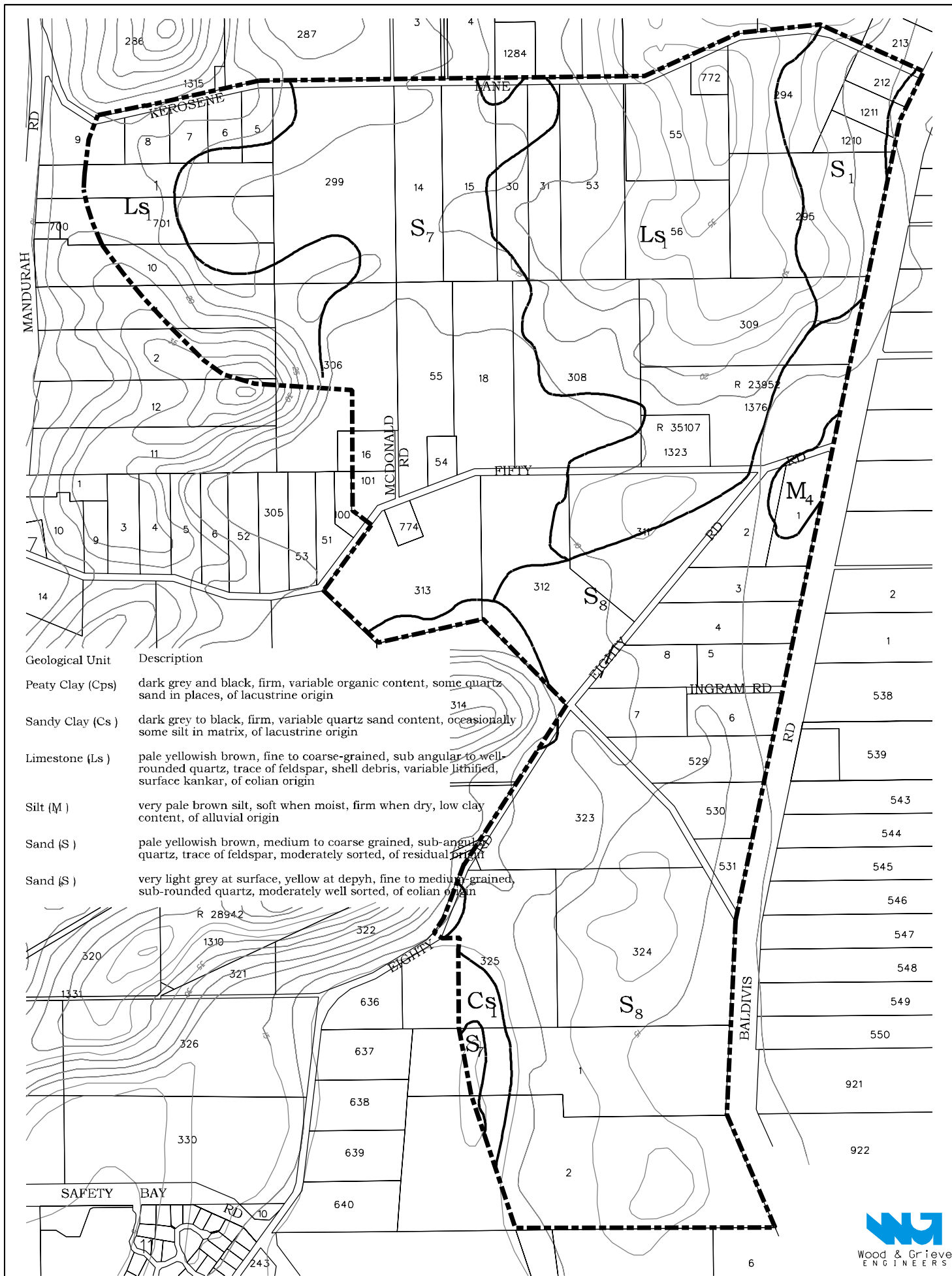
3.2.3 Wetlands and Surface Hydrology

Although wetlands, damplands and sumplands occur throughout the Baldivis locality, the study area is relatively elevated from the water table and well drained due to porous surface soils. Consequently, wetlands which are located within the Study area or have influence within the study area are limited to Tamworth Hill Swamp in the south-west, and Opwin Swamp, west of the intersection of McDonald and Fifty Roads. An unnamed basin, which is a man-made dam, is located between Fifty and Eighty Roads. These wetlands and others outside of the study area have been mapped by Hill et al., (1996), and are surface expressions of the unconfined aquifer (shallow groundwater).

Wetlands adjacent to the study area include Lake Coo loongup located directly west of Mandurah Road, Spot Swamp, south of Fifty Road and Kerosene Lane Swamp, north of Kerosene Lane. Extensive areas of dampland and seasonally waterlogged palusplain occur east of Baldivis Road.

Lake Coo loongup and Tamworth Hill Swamp are identified by the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992. With the exception of the unnamed basin wetland (located on Lot 312 Fifty Road), all wetlands are classified as conservation wetlands.

Conservation wetlands are described as wetlands which support high levels of ecological attributes and functions. The management objectives for these wetlands are to preserve the existing attributes and functions through reservation in National Parks, Crown Land and protection under Environmental Protection Policies (Hill et al., 1996).



PROJECT

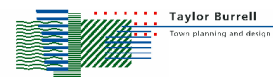
CLIENT
City of Rockingham

FIGURE NO.
5

NORTH



ENVIRONMENTAL GEOLOGY BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN



Wood & Grieve
ENGINEERS

Taylor Burrell
Town planning and design

No natural surface drainage channels are apparent due to the porous nature of the surface soils which limit run-off potential. Following development, the direction of surface drainage within the study area will be dependent upon topographical catchments. This factor has been considered in the engineering component of the study.

The eastern portion of the study area lies within the legal catchment boundary of the Peel-Harvey Estuary, which is further discussed later in the report.

3.2.4 Groundwater

The porous soils and slopes support recharge of winter rainfall, with 15-30% infiltration estimated by Davidson (1995) as typical for this type of terrain.

There are three major unconfined aquifers which underlie the study area; the superficial (the uppermost aquifer), the Leederville (the middlemost), and the Yarragadee (the deepest aquifer).

On a regional basis, the superficial aquifer has been divided into discrete hydrogeological areas, also referred to as mounds, on the basis of topography, geology and the discharge boundaries formed by rivers and the ocean.

More than two-thirds of the northern portion of the study area is located on the southern extremity of the Jandakot Mound, whilst the remainder is located on the northern extremity of the Stakehill Mound (Davidson, 1995). The study area is also located over a groundwater col, which is a term describing the confluence, or meeting point, of two or more groundwater mounds. In this case, the col is at the base of both the Jandakot and Stakehill Groundwater Mounds, and covers a relatively expansive area (many square kilometres).

Regional groundwater flow from both the Jandakot and Stakehill Mounds is generally in a westerly direction in this locality.

Locally, groundwater movement through the soils beneath the study area will vary in velocity and direction depending upon seasonal influences. During winter, localised recharge through the sandy soils, together with discharge from the Jandakot and Stakehill Mounds, causes groundwater movement to the north-west, west and east (Davidson, 1995). In summer, when little or no recharge occurs and any localised winter mounding of the water table beneath the site dissipates, groundwater movement is generally to the west in accordance with regional flow characteristics.

The vertical separation distance between the land surface and the superficial aquifer (watertable) beneath the majority of the site is generally between 10 and 20m when the groundwater is at maximum levels, and up to 30m beneath the highest hill crests (Gozzard 1983). The site is located within the Water Corporation's Stakehill Groundwater Area. Groundwater areas are proclaimed when it appears that groundwater use may exceed the available supply. A licence is required if more than 1,500 kilolitres of groundwater is extracted per year.

3.3 Biological Environment

3.3.1 Vegetation Complexes

Regional vegetation mapping by Heddle et al. (1980, 1:250,000 scale) indicates two vegetation complexes over the study area, the Cottesloe Complex - Central and South in the western two thirds (approximately), and the Karrakatta Complex - Central and South in the east.

The Cottesloe Complex - Central and South is described as containing a mosaic of woodland of *Eucalyptus gomphocephala* and an open forest of *E. gomphocephala*, *E. marginata* and *E. calophylla* and closed heath on the limestone outcrops.

The Karrakatta Complex - Central and South is described as predominantly an open forest of *E. gomphocephala*, *E. marginata* and *E. calophylla* and a woodland of *E. marginata* and *Banksia* species.

Vegetation fringing Coo loongup Lake comprises *Eucalyptus gomphocephala* forest, *Melaleuca raphiophylla* scrub and *Baumea juncea* and *Gahnia trifida* sedgeland (V & C Semenuik Research Group, 1991). The vegetation structure and composition at Spot Swamp is a shrubland of *M. raphiophylla* and *M. teretifolia*. The sedgeland previously present at this wetland has been cleared. At Tamworth Hill Swamp the wetland vegetation consists of a *M. teretifolia* and *M. raphiophylla* heath and forest, and sedgeland comprising of *Baumea articulata* and *Lepidosperma* species. The north-east section of this wetland has been filled and is now pasture.

Significant areas of remnant Cottesloe Complex - Central and South vegetation occur adjacent to the study area surrounding the Water Corporation's water reservoir on Eighty Road, and also north of Kerosene Lane. These areas are both reserved.

3.3.2 **Vegetation Condition**

A large proportion of the study area has been cleared for agricultural activities, however some areas of vegetation remain as depicted in **Figure 6**.

Based on an examination of the aerial photography, two relatively dense areas of remnant vegetation occur in the east and west of the site, with a further five parcels considered as "moderate" in density. The remainder of the study area retains either low density or scattered remnant vegetation, or is cleared.

3.3.3 **Declared Rare and Priority Flora**

No specific search for Declared Rare and Priority flora has been undertaken as part of the current investigation. However, the Department of Conservation and Land Management's Threatened (Declared Rare) Flora database, the Department's Priority Species List, and the Western Australian Herbarium Specimen database were accessed for records from the area and surrounds.

No Declared Rare Species have been recorded from the study area, however four Priority 3 species have been recorded from the region, *Rhodanthe pyrethrum*, *Schoenus benthamii*, *Stylidium longitubum*, *Dillwynia dillwynioides*, with the closest record located approximately 2km to the north. Priority 3 taxa are those which are known from several populations, and are not under immediate threat.

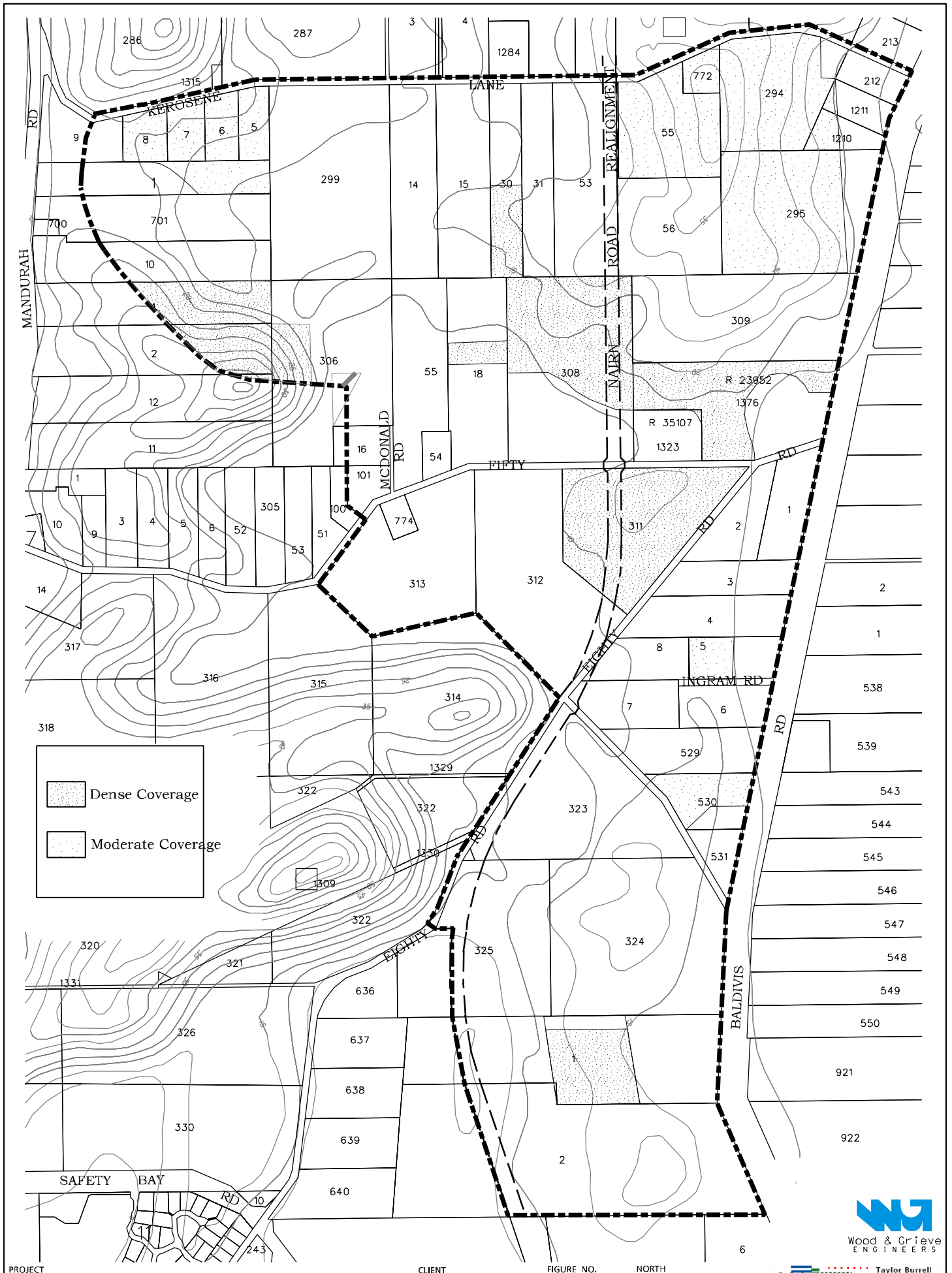
The information provided by CALM may be regarded as an indication of the potential for Declared Rare and Priority flora which may be present in the area. Given that a number of stands of remnant vegetation occur within the study area, it is anticipated that botanical surveys would be conducted as a component of future Comprehensive Development Plans.

3.3.4 **Fauna**

Records from the Department of Conservation and Land Management Threatened Fauna database have been accessed. These records list species which are declared rare or likely to become extinct (Schedule 1), birds protected by international agreement (Schedule 3), and other specifically protected fauna (Schedule 4).

The records indicate that threatened fauna have not been recorded from the study area, however, the habitat of the area may be infrequently visited by two specially protected bird species (Carnaby's Cockatoo and the Peregrine Falcon), and that the Carpet python, Quenda and Western Brush Wallaby may also occur.

Given that neither bird species nest in the area and that all species noted are relatively mobile, and that clearing would likely be undertaken in stages, thereby allowing opportunity for escape to neighbouring bushland, their possible infrequent presence could not be considered an impediment to the development of the study area.

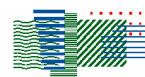


**REMNANT VEGETATION
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**

● subjective assessment only



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Town planning and design

3.4 Social Environment

3.4.1 Existing Land Uses

The subject land contains a variety of rural land uses, the predominant active use being market gardens (refer to **Figure 7**). The balance of the land is used for grazing, horse agistment, and hobby farm type pursuits. Three poultry farms also operate within the study area. Another notable land use is the veterinary clinic and hospital located on Lot 295 Baldvis Road.

Outside of this study area a similar variety of rural uses generally occurs. To the south-west of the subject land, the first stages of Settlers Hill's residential estate are found. Other land uses of note include; the John Calvin Free Reform Church and School and Christian Youth Camp located west of Precinct 2; WA Limestone excavation to the north of the area and Palm Nursery to the east of Precinct 1. It should also be noted that there are poultry farms and market gardens, which are situated adjacent to the subject land where their respective buffers encroach into the Structure Plan area.

3.4.2 Aboriginal Heritage

A specific archaeological and ethnographical survey of the study area has not been undertaken as part of this study. Access to the Department of Aboriginal Affairs records database indicates that a number of archaeological sites have previously been noted from the locality, namely on Baldvis Road (3 sites) and the CMS Parmelia gas pipeline route (1 site). The exact locations have not been provided by the Department at this time. Sites generally consist of small artefact scatters located in disturbed areas.

Further discussion with the Department of Aboriginal Affairs through a suitable consultant will be required in order to locate and assess the known sites in the preparation of individual CDP's.

3.5 Environmental Issues and Policies

3.5.1 CMS Parmelia Pipeline

A high-pressure natural gas pipeline traverses north-south through the Structure Plan area. The pipeline, known as the CMS Parmelia Pipeline, is owned by CMS Gas Transmission Australia. The pipeline is buried approximately 760mm to 850m underground and lies central to a 12m easement. This easement has a dual role of protecting the pipeline from development and is also the area in which compensation is paid to landowners. The pipeline is also protected by two buffer zones administered by the Department of Environmental Protection (DEP) and the Department of Minerals and Energy.

The Department of Environmental Protection is currently undertaking a formal environmental review of use of land within the buffer areas as part of the assessment of the rezoning of the Baldvis Town Centre (Amendment 295) and of Lots 1 and 2 Baldvis Road.

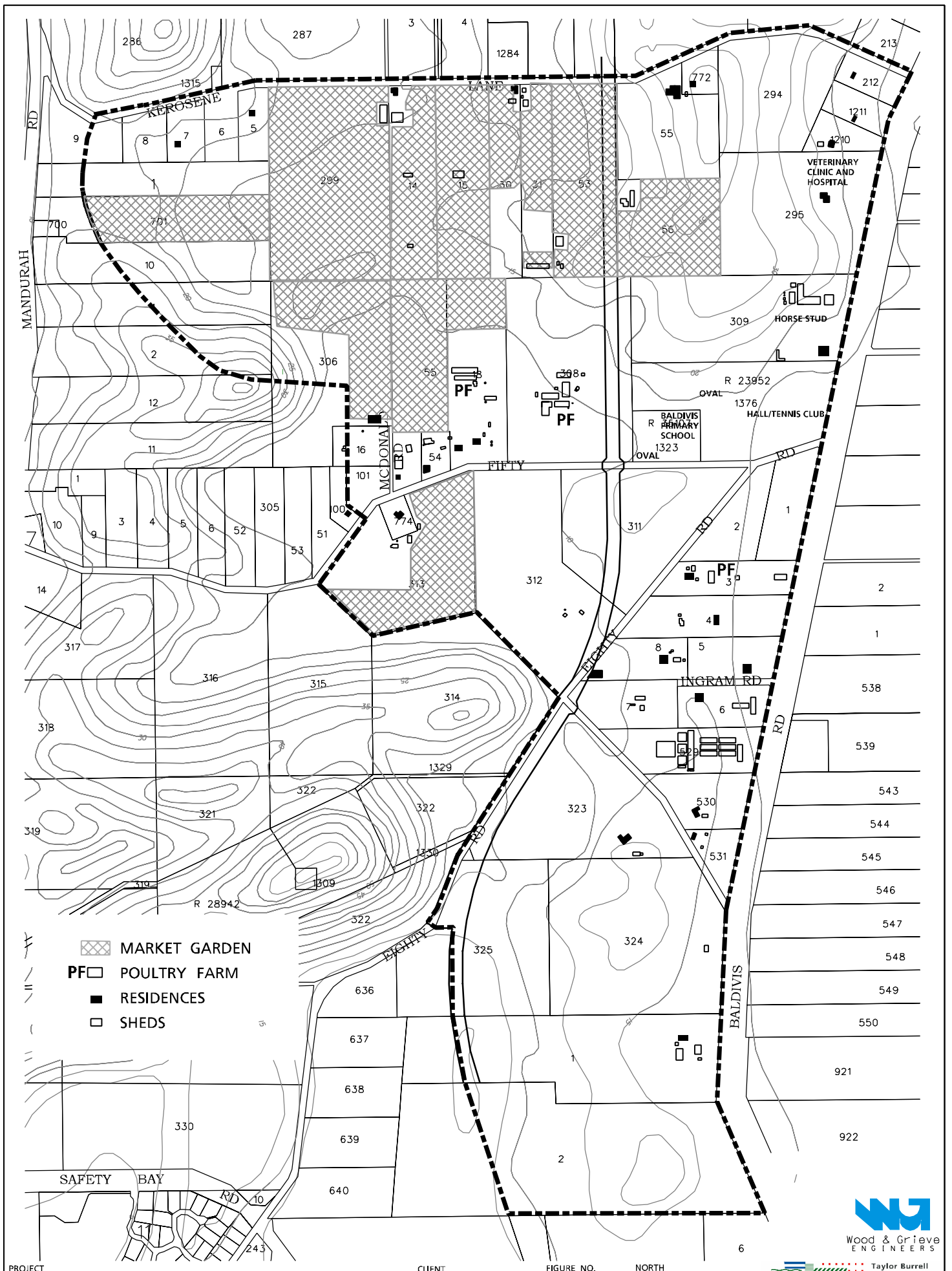
While environmental conditions have not yet been set by the Minister for the Environment, the following highlights the current draft recommendation from the Department of Environmental Protection.

The first buffer zone lies 32m either side of the pipeline in which the following landuses may be accepted:

- Cycleways and footpaths;
- Roads and road crossings (with minimum cover of 1.2m over the pipe);
- Public signage;
- Temporary carparking (minimum cover of 1.25m over the pipe).

Within the 32m buffer no residential development or private lots are permitted.

The second buffer lies 96m either side of the centre of the pipeline and within this area the following uses may not be permitted:

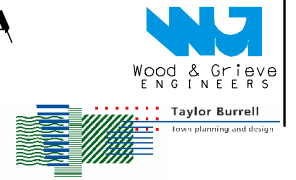


PROJECT
LAND USE PLAN
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN

CLIENT
 City of Rockingham

FIGURE NO.
 7

NORTH



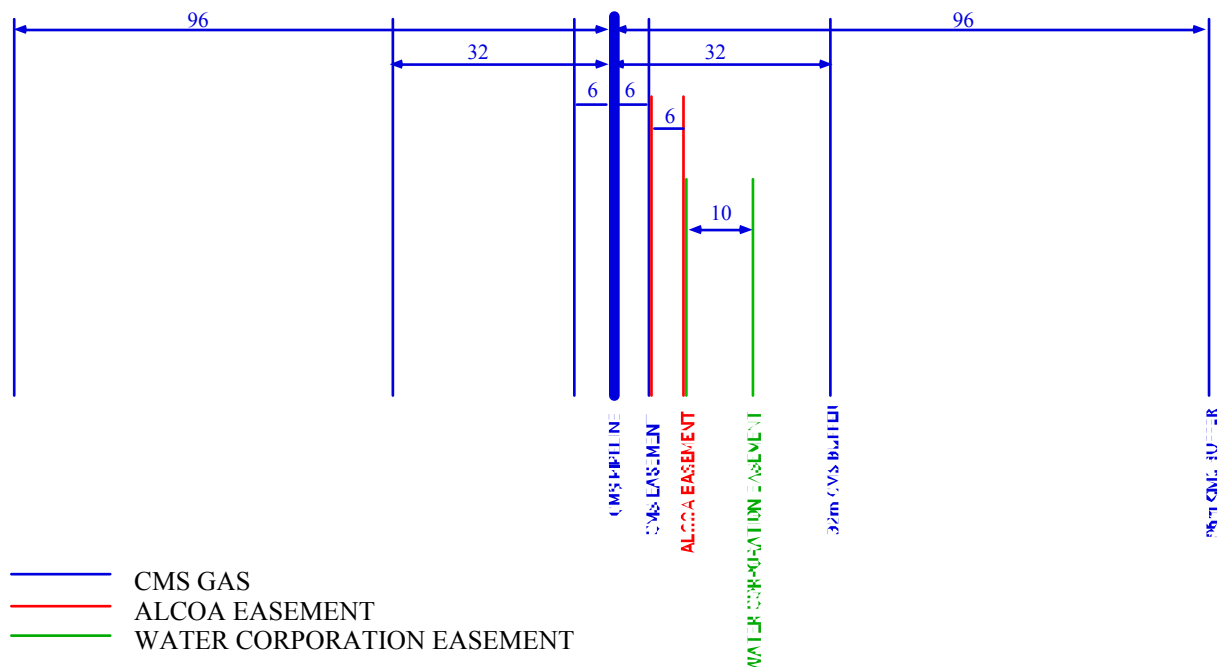
- Aged persons accommodation;
- Childcare centre;
- School;
- Hospital;
- Uses or development where large numbers of people may congregate.

Parallel to the CMS 12m easement lies an easement in favour of Alcoa. This easement is 6m in width and lies immediately adjoining the eastern side of the CMS 12m easement. The easement is to provide protection for a proposed slurry pipeline. In addition, the Water Corporation plans to install a 1.4m diameter water mains 16m east and parallel to of the CMS pipeline. This pipeline is also to be protected by a 10m wide easement. The easement is proposed to be located off centre, being 4m west of the pipeline and 6m east of the pipeline. The whole of this easement will be located within the 32m buffer of the CMS Parmelia Pipeline. Water Corporation has confirmed that land uses of public open space and road reserves will be permitted within their water mains pipeline easement.

The water mains is programmed to be constructed in 2000/2001.

A detailed plan showing the locations of pipelines and easements on the CMS Parmelia Pipeline, Alcoa proposed pipeline, and Water Corporation proposed water mains is shown in **Figure 8**.

FIGURE NO. 8 - CMS, ALCOA AND WATER CORPORATION EASEMENTS AND BUFFERS



3.5.2 Poultry Farms

Within the study area there are currently 3 poultry farms in operation. Two of these farms are located adjoining each other on Lots 18 and 308 Fifty Road, the other is located on Lot 3 Eighty Road/Baldivis Road.

The Department of Environmental Protection Draft Policies, Guidelines and Criteria for Environmental Impact Assessment Number 3 Industrial - Residential buffer areas (separation distances) (EPA 1997A) recommends a buffer distance of 500m between both poultry farms and market gardens to residential areas to address potential spray drift, and impacts from noise, dust and odour.

The Western Australian Planning Commission's (WAPC) draft Statement of Planning Policy No. 5 - Poultry Farms (1997) also advocates a 500m buffer to new residential areas in the absence of further site specific information to demonstrate otherwise. **Figure 9** highlights the buffer zone areas within which residential development may not be permitted. The figure shows that significant portions of Precincts 1 and 2 fall within buffer areas. In addition, the western portion of Precinct 2 also falls within a buffer zone area relating to a poultry farm located on Mandurah Road. These buffer areas have implications for staging of residential development. Simply, while the poultry farms remain in operation, residential development may not occur within the 500m buffer zone identified.

There is opportunity, however, for a reduced buffer area to be accepted by the Department of Environmental Protection and the WAPC through preparation of the dynamic olfactometry assessment. Such technical assessment of local prevailing winds, climatic conditions and management operations of the poultry farm may result in a lesser buffer distance being accepted. The preparation of a dynamic olfactometry analysis would be required prior to the subdivision of any affected land and should be undertaken in conjunction with market garden buffers which affect the majority of land within the Structure Plan area.

3.5.3 Market Gardens

As mentioned above in 4.5.2 the Department of Environmental Protection requires a 500m buffer between residential areas and market gardens under a draft policy. The effect of this requirement is illustrated in **Figure 9**.

3.5.3.1 Buffer

Figure 9 shows that the majority of the study area is affected by market garden buffers.

The DEP has in practice in recent time taken a more considered, pragmatic and balanced approach in its implementation of the buffer requirements in its consideration of residential rezonings and subdivision.

Subject to the preparation of an assessment of specific management practices and site factors on the operations of a market garden for a specific rezoning or subdivision applications, the DEP may consider a lesser buffer distance or allow rezoning or subdivision to proceed subject to:

- Time limitations on the operation of the market garden;
- Caveats on titles to advise intending purchasers of existence of market gardens;
- Planting of vegetation buffers around the market garden, subject to agreement by the MFP.

The preparation and consideration of such assessments would need to form part of a CDP or subdivision application.

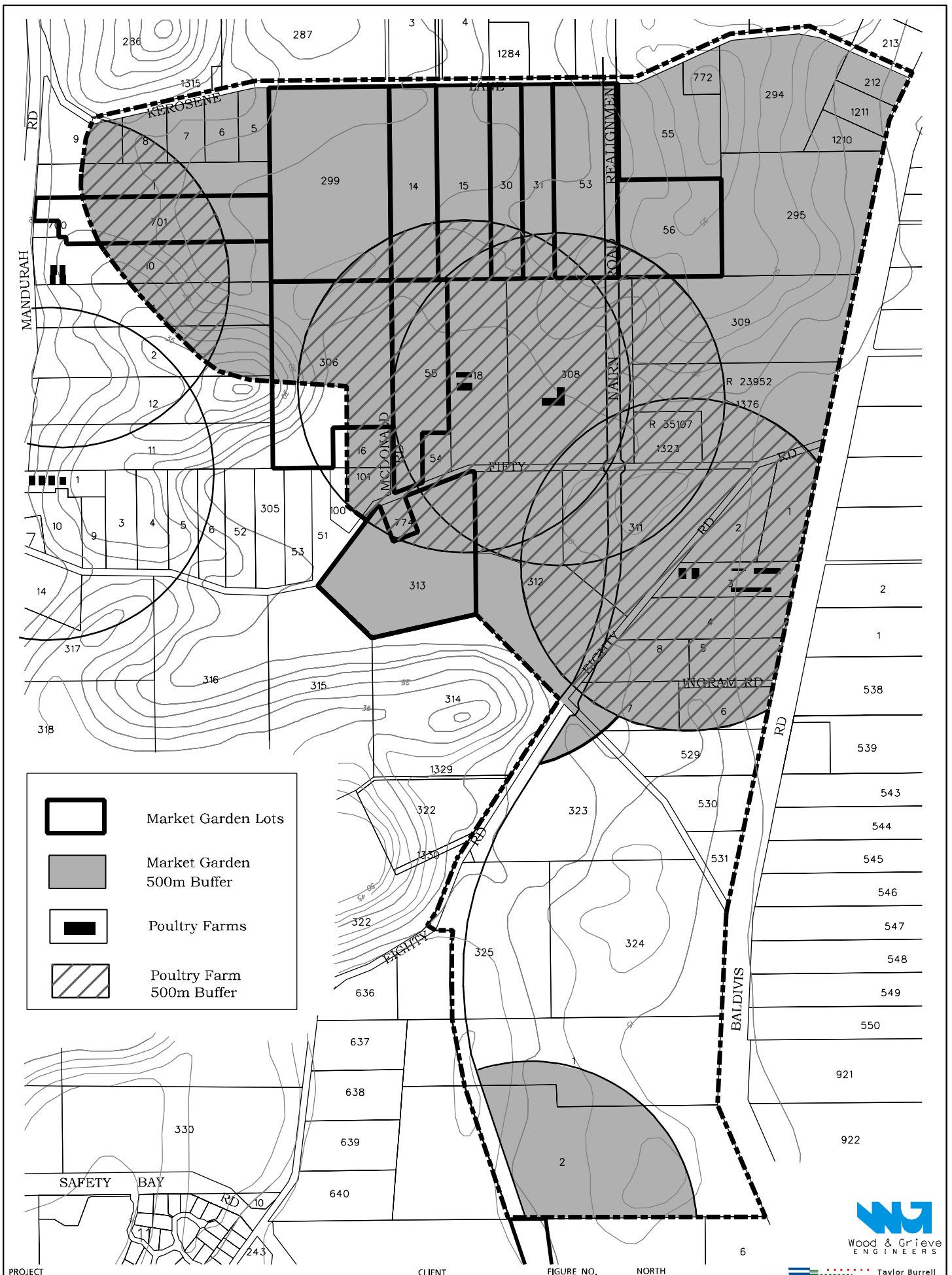
It is also anticipated that with the advent of residential development into the study area, the operation of the market gardens will voluntarily cease over time, thus making more land to become available for residential development.

While the market garden buffers will present potential constraints to some areas from residential development, the current approach to the implementation of the buffers by the DEP provides scope for individual landowners of affected land to undertake the necessary environmental assessment and negotiate a position with the DEP.

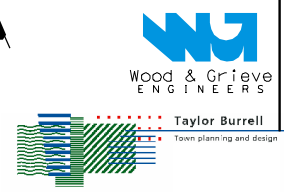
3.5.3.2 Soil Contamination

Historical horticultural and ancillary activities at market garden properties may have contaminated onsite soils and groundwater. The principal contaminants of concern at horticultural properties include the following.

- Pesticides
- Trace Metals
- Hydrocarbons



PROJECT: MARKET GARDENS & POULTRY FARM BUFFERS
 CLIENT: City of Rockingham
 FIGURE NO.: 9
 NORTH



Over the past few years, the DEP has required horticultural land proposed for residential development to undergo a Site Contamination Assessment and Management Program. Typically, the requirement becomes a condition of Western Australian Planning Commission (WAPC) subdivision approval. This matter will need to be discussed by proponents in preparation of CDPs.

3.5.4 Bushplan

Perth's Bushplan (Ministry for Planning, 1998) makes recommendations for conservation in the Perth Metropolitan Region, focussing on the retention and protection of selected areas of native vegetation through a number of implementation methods.

No sites within the study area have been identified within Bushplan as having "Regionally Significant Bushland", however areas of "Other Native Vegetation" are noted, together with the "Conservation" category wetlands previously described.

Bushplan is a draft proposal at this stage. The document does not have any formal endorsement at this time.

Bushplan Site No. 356 is located outside, but adjacent to the study area, and includes land surrounding the Water Corporation's reservoir site, land north of Kerosene Lane (Lot 1387), and Tamworth Hill Swamp. These areas of remnant vegetation form part of a large site encompassing both Lake Coo loongup and Lake Walyungup and surrounds.

3.5.5 Basic Raw Materials Resource Protection Policy

In March 1992, the (then) Department of Planning and Urban Development released the Basic Raw Materials Policy Statement for the Perth Metropolitan Region (DPUD, 1992a) to identify and protect basic raw material reserves and avoid future land use conflicts.

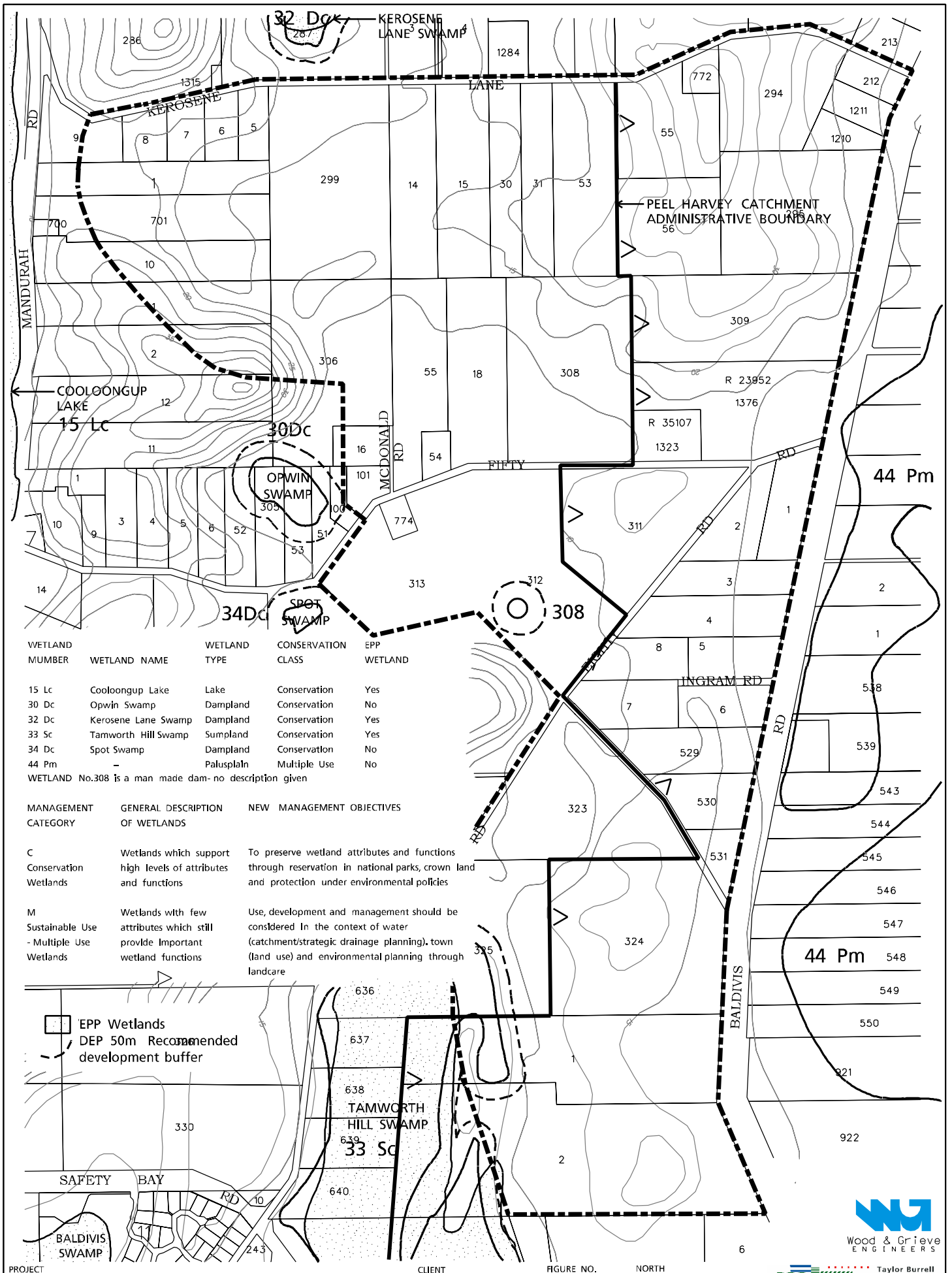
The study area is not designated for Priority Resource extraction under the Policy Statement, and is noted as Future Urban.

Two leases are identified; 28/4 on Lot 299 Kerosene Lane by Readymix for the extraction of limestone which has been exhausted and is now a market garden; and M70/558 on Lots 636 to 640 inclusive on Eighty Road for the extraction of peat from part of Tamworth Hill Swamp. Environmental approval however, was refused by the DEP, EPA and the Minister for Environment.

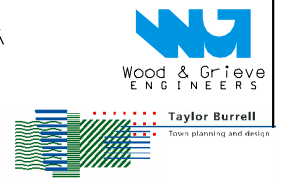
3.5.6 Peel-Harvey Coastal Plain Catchment

The Statement of Planning Policy No. 2 for the Peel-Harvey Coastal Plain Catchment (DPUD, 1992b) was Gazetted in February 1992. The area of the Structure Plan within the catchment boundary is shown in **Figure 10**. This policy requires that land use changes within the catchment likely to cause environmental damage to the estuary are now brought under planning control. The objectives of the policy are:

- To improve the social, economic, ecological, aesthetic, and recreational potential of the Peel-Harvey Coastal Plan Catchment.
- To ensure that changes to land use within the Catchment to the Peel-Harvey Estuarine System are controlled so as to avoid and minimise environmental damage.
- To balance environmental protection with the economic viability of the primary sector.
- To increase high water-using vegetation cover within the Peel-Harvey Coastal Plain Catchment.
- To reflect the environmental objectives in the Draft Environmental Protection Policy (Peel-Harvey Estuarine System) 1992.
- To prevent land uses likely to result in excessive nutrient export into the drainage system.



**EPP WETLANDS & WETLANDS ATLAS
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**



The Western Australian Planning Commission requires that all town planning schemes operating within the Peel-Harvey Coastal Plain Catchment shall require all development to be subject to the provision in this policy.

3.5.7 Environmental Protection (Swan Coastal Plain Lakes) Policy 1992

The Environmental Protection (Swan Coastal Plain Lakes) Policy 1992 (EPA, 1992a) protects the environmental values of lakes on the Swan Coastal Plain. Wetlands included within the Policy are afforded protection against disturbance or alteration to their hydrological regime.

No EPP wetlands exist within the study area. The closest EPP wetlands to the study area are Tamworth Hill Swamp, Kerosene Lane Swamp and Lake Cooloongup (see **Figure 10**).

These wetlands are afforded protection under the Policy against disturbance or alteration to the hydrological regime including:

- Filling
- Excavating or mining
- Discharge or disposal, or
- Draining

3.5.8 Environmental Protection (Peel Inlet - Harvey Estuary) Policy Approval Order 1992

The Environmental Protection (Peel Inlet - Harvey Estuary) Policy Approval Order 1992 (EPA, 1992b) provides environmental quality objectives for the Estuary, which if achieved were considered to rehabilitate the Estuary and protect from further degradation. The policy also outlines the means by which the environmental quality objectives for the Estuary are to be achieved and maintained. The area affected by this policy is the same as the Peel-Harvey Coastal Plain Catchment boundary as shown in **Figure 10**.

The policy approval order highlights the causes and results of nutrient enrichment in the estuary. The causes include clearing of native vegetation in the policy area and land uses that result in nutrients leaching into waterways in the policy area, then flowing into the estuary. The results of these actions include the stimulation of excessive growth of algae and its resulting impacts.

The overall environmental quality objective of the policy is to achieve a median load (mass) of total phosphorus flowing into the estuary of less than 75 tonnes. This is divided into less than 21 tonnes from the Serpentine River, less than 16 tonnes from the Murray River and less than 38 tonnes from the Harvey River. These environmental quality objectives are to be achieved through:

- (a) implementation of the planning policy by local authorities through their relevant town planning schemes and by the Western Australian Planning Commission through the Metropolitan Region Scheme.
- (b) appropriate land management by landholders and management authorities in the policy area;
- (c) government extension services including the provision of advice to landholders in the policy area; and
- (d) local authorities and the State ensuring that decision and actions are compatible with the achievement and maintenance of the environmental quality objectives.

4.0 CONTEXT ANALYSIS

4.1 Regional Context

The subject land has been recognised through both strategic and statutory regional planning, as part of a substantial residential cell within Perth's metropolitan south-west corridor. The area forms the northern portion of the Balddivis residential area, the balance of which (south of Safety Bay Road) is subject to the Balddivis Structure Plan, which has been adopted by Council.

Figure 11 provides a graphic representation of the site in its context with the planned development of the surrounding area. In essence it can be seen that the Structure Plan area provides a relatively thin corridor of urban use between a mix of rural land and Regional Open Space. The Structure Plan area provides an extension to the urban areas existing and proposed south of Safety Bay Road and planning should recognise the commitments already made in this area. The Context Analysis plan incorporates the latest structure planning for the Balddivis urban area to the south, and for the western, northern and eastern areas, essentially shows intended zonings recommended under Council's Rural Land Strategy.

4.1.1 Regional Roads - Existing Situation

Within the vicinity of the Structure Plan area, there are two existing major roads recognised under the MRS. These are Mandurah Road, running north-south and located west of the Structure Plan area which is reserved as an Other Major Highway and Safety Bay Road which runs east-west and lies below the southern boundary of the Structure Plan area and is reserved Important Regional Road. Mandurah Road provides an alternative regional link from Perth to Mandurah. While road signs coerce Mandurah and other south bound traffic along Ennis Avenue, Mandurah Road is a well-known alternative route. Mandurah Road has a 60m wide road reserve and contains a single carriage way with two way traffic, and for the most part has a speed limit of 100km per hour.

Balddivis Road also provides a major road function and runs parallel to Mandurah Road forming the eastern boundary of the Structure Plan area. Balddivis Road primarily plays a district distributor role but since the extension of the Kwinana Freeway to Thomas Road, the section adjoining the study area has been utilised as a reliable short cut for travellers heading to Mandurah and other southern country destinations. Balddivis Road has an 80m wide road reserve, but a significant proportion is reserved as a greenbelt recreational spine following the former Balddivis Tramway Reserve. Balddivis Road contains a single carriage way and has a speed limit of 80km per hour.

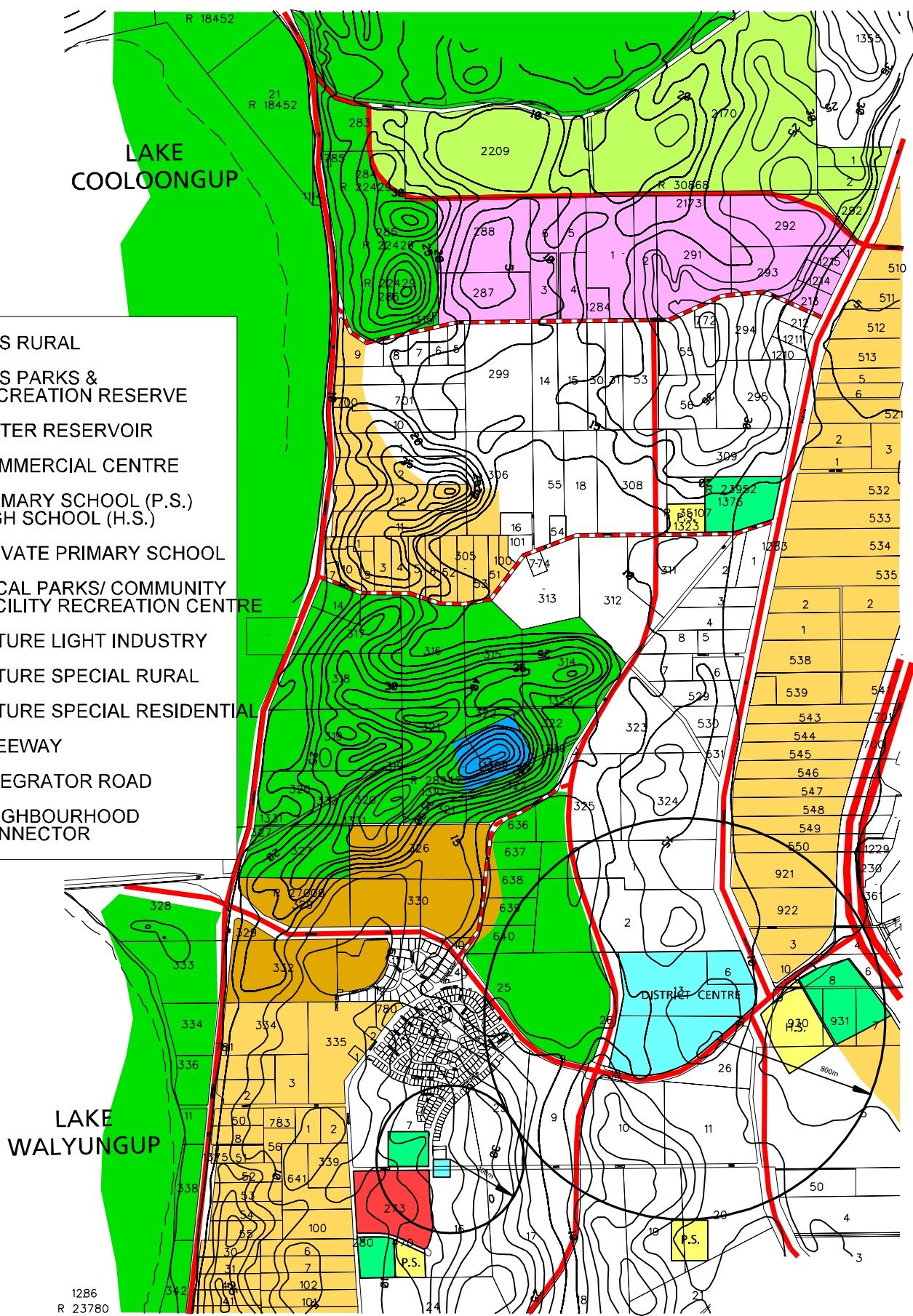
In 1995, Safety Bay Road was extended to link Balddivis Road with Mandurah Road. The road was constructed essentially to provide access to the Settlers Hills development, a residential estate located to the south-west of the Structure Plan area. Safety Bay Road is reserved as an Important Regional Road and currently consists of a single carriage way with two way traffic movement and a speed limit of 80km per hour.

4.1.2 Regional Roads - Proposed Situation

Planning for the regional road network within the vicinity of the Balddivis (North) District Structure Plan area is in place. Approximately 800m east of Balddivis Road is the Kwinana Freeway Reserve. Under Main Roads WA program, the freeway is planned for construction in the year 2001.

This section of freeway, when opened, will have a significant impact on the Structure Plan area, removing almost all current regional based traffic from Balddivis Road and reducing traffic volumes along the adjoining section of Mandurah Road.

The Structure Plan area will also benefit having close access to the freeway. Access from the study area will be provided by the extension of Mundijong Road west of Balddivis Road, located to the north of the study area, and Safety Bay Road to the south of the study area. These roads will provide strategic links onto the freeway.



- MRS RURAL
- MRS PARKS & RECREATION RESERVE
- WATER RESERVOIR
- COMMERCIAL CENTRE
- PRIMARY SCHOOL (P.S.)
HIGH SCHOOL (H.S.)
- PRIVATE PRIMARY SCHOOL
- LOCAL PARKS/ COMMUNITY
FACILITY RECREATION CENTRE
- FUTURE LIGHT INDUSTRY
- FUTURE SPECIAL RURAL
- FUTURE SPECIAL RESIDENTIAL
- FREEWAY
- INTEGRATOR ROAD
- NEIGHBOURHOOD
CONNECTOR



CONTEXT ANALYSIS
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN



Linking the Structure Plan area to the proposed Mundijong Road extension and Safety Bay Road is the proposed Important Regional Road, Nairn Drive. Nairn Drive is planned to run north to Mundijong Road and south to Paganoni Road in Karnup. Through the Structure Plan area, Nairn Drive has generally a 40m wide road reserve and is intended to alternately carry a dual carriageway. Nairn Drive will provide a significant district and regional role in the Structure Plan area. The alignment of Nairn Drive has been fixed under the Metropolitan Region Scheme and has been incorporated into the Structure Plan.

4.1.3 Education

4.1.3.1 High Schools

In its 1998 review of the Baldivis District Structure Plan, covering all that area south of Safety Bay Road, the Education Department in consideration of high school allocation also included an assumed lot yield for Baldivis (north of Safety Bay Road).

The Education Department accepted the 8356 lot yield proposed under the Baldivis Structure Plan for the area south of Safety Bay Road and assumed a 3730 lot yield for the area of Baldivis, north of Safety Bay Road and determined the need for 1.5 high schools. This conclusion was based on the Education Department's School Site Criteria Policy which stipulates that a high school is required for every 9000 residential lots. The Education Department resolved that two high schools should be provided to cater for the long term development of the area. (Refer letter, **Appendix 2**)

The Education Department accepts that the identified location of a high school site, south of Safety Bay Road provides a suitable central location to serve the populations north and south of Baldivis Road. The second high school site is located near the southern boundary of the Baldivis Structure Plan area.

The provision of these two schools caters for the needs of all future Baldivis residents north and south of Safety Bay Road.

4.1.3.2 Primary Schools

In the consideration of allocation and distribution of primary schools in its assessment of the Baldivis Structure Plan (1998) area, south of Safety Bay Road, the Education Department considered that the area requires the provision of six primary school sites. These are to provide for the population generated within the Structure Plan area only. The Education Department acknowledged that the area of Baldivis north of Safety Bay Road needs to be self contained and stated that this area requires an additional school to the existing Baldivis Primary School, located on Fifty Road, to cater for the expected population.

4.1.4 Retail

Regional level shopping is provided by the Rockingham Strategic Regional Centre located 8kms to the west of the Structure Plan area. A district centre (Baldivis Town Centre) is proposed immediately south of the southern boundary of the structure plan area as identified in the Baldivis Structure Plan. The district centre is proposed to have a retail floorspace allocation of 25000m² net leasable area as recognised by Council's Retail Structure Plan. The district level shopping needs of Baldivis (North) residents shall be provided by this centre therefore the Baldivis (North) District Structure Plan needs only to provide for local or neighbourhood level shopping requirements. A proportion of the southern area of the Structure Plan is located within the 800m catchment of the District Centre. The design within this area should be conscious of providing residential densities and a road pattern which maximises the opportunities for access to the District Centre.

Six local or neighbourhood level shopping centres are identified within the Baldivis Structure Plan. These centres provide a self contained provision of neighbourhood level shopping for the Baldivis Structure Plan area which includes the residential population of the Baldivis District Town Centre.

4.1.5 Surrounding Rural Land

The area of land located between the Kwinana Freeway (reserve) and the Structure Plan area is identified as suitable for "Special Rural" under Council's Rural Land Strategy (Precinct 3) with a minimum lot size of 2ha. The introduction of such zoning will contribute to future population growth in the vicinity of the Baldivis residential cell. Safety Bay Road, located to the south, and Mundijong Road, located to the north of the Structure Plan area, provide the only two east west linkages, in the vicinity, onto the Kwinana Freeway extension. This will influence the pattern of traffic movement through the Structure Plan area.

The area to the north of the Structure Plan area is identified under Council's Rural Strategy as proposed for light industrial/service commercial. This area is contained within Kerosene Lane, Baldivis Road, the future extension of Mundijong Road and Parks and Recreation Reserve land to the west. The Strategy acknowledges that the location of such industrial use provides an effective buffer between the proposed urban development of the Structure Plan area and the City of Rockingham waste disposal site, Western Mining Corporation tailing ponds and future regional cemetery to be located north of Millar Road. Attention will need to be given to provide an appropriate interface between the proposed residential areas to the south and the light industrial/service commercial use to the north of Kerosene Lane.

The area located west of the western boundary of the Structure Plan area between Kerosene Lane and Fifty Road is identified under Council's Rural Land Strategy as Special Rural west of the ridge line and Special Residential east of the ridge line. Special Rural lots of 1ha have been recommended in order to maintain the rural viewshed from Mandurah Road whilst the Special Residential is proposed on the eastern side of the ridge as a transition between the urban/residential development of the Structure Plan area and the Special Rural zone area. Suitable road connections should be provided between the residential areas of the Structure Plan and the proposed Special Residential area.

The Baldivis water reservoir is located to the south of Fifty Road and to the west of the Structure Plan area boundary. The area surrounding the reservoir is protected by Parks and Recreation reservation. This area has the potential to serve a passive Regional Open Space function for the residents of the District Structure Plan area.

4.2 Opportunities and Constraints

A graphical representation of opportunities and constraints is shown in **Figure 12**.

4.2.1 Landform

Most of the area within the Structure Plan contains slightly undulating landform.

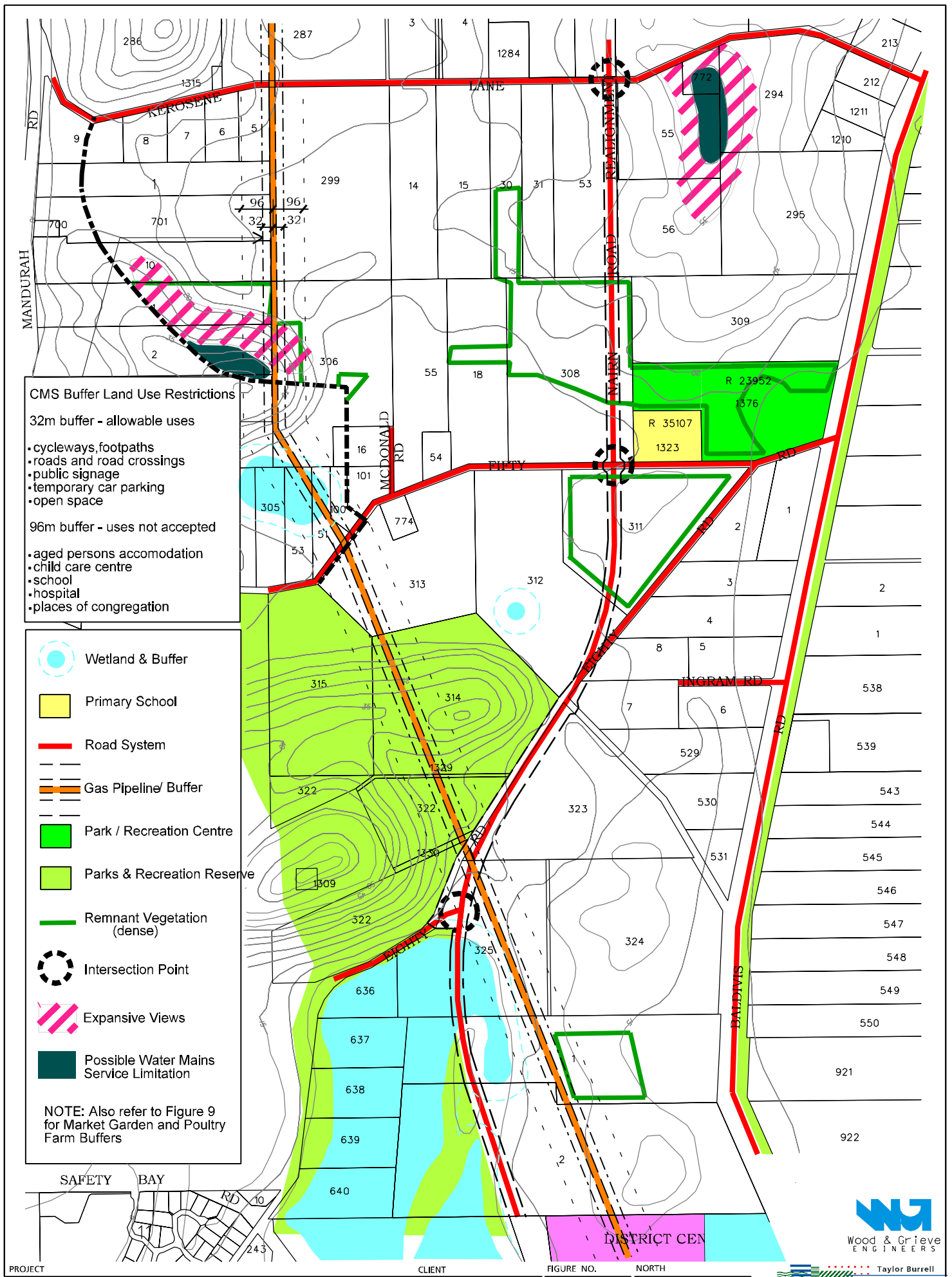
There are two high points within the Structure Plan area which have the potential to provide expansive views eastward overlooking the Swan Coastal Plain, toward the Darling Scarp.

The first area is a small ridge which runs north-south and is located near Kerosene Lane within Precinct 1. There is opportunity with sympathetic road design to maximise the number of lots which may enjoy views to the east. The other area is the high point of the ridge line which runs outside of the Structure Plan's western boundary near Mandurah Road. The north-eastern part of this hill encroaches into the Structure Plan area and again provides potential for expansive views towards the east and north-east overlooking the Swan Coastal Plain and Darling Scarp. The opportunity arises for the location of dress circle lots along these two ridgelines.

These high areas are, however, potentially constrained for development as they may be difficult to service.

4.2.2 Wetland

The unnamed wetland located on Lot 312 Fifty Road has the potential to be utilised and developed as an artificial wetland, serving as a drainage containment basin, and providing an attractive outlook for the surrounding residential area.



DESIGN OPPORTUNITIES & CONSTRAINTS
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN

The Tamworth Hill Swamp wetland extends over Nairn Drive into the Structure Plan area. While the Tamworth Hill Swamp is an EPP Wetland, the eastern area (located within the Structure Plan) has not been designated as an EPP wetland. The Department of Environmental Protection is currently undertaking a formal environmental assessment of the proposed subdivision of Lots 1 and 2.

It is understood that while the land has been segregated from the main Tamworth Hill Swamp, it still provides a wetland function where use is likely to be limited to open space and water sensitive designed drainage purposes.

4.2.3 CMS Parmelia Pipeline

The CMS Parmelia Pipeline traverses north-south through North Baldivis and imposes significant land use and development restrictions and prejudices design options.

As mentioned in Section 3.5.1 there are two land use buffer alignments, the smaller at 32m (either side of pipeline) restricts housing or any other buildings. This effectively creates a 64m wide channel within which no physical development may take place. Up to the 96m buffer, schools and other specific uses where large numbers of people may congregate are not permitted. These restrictions directly influence the nature of land use allocation in the Structure Plan. In addition, roads may cross the pipeline but are required to cross at a 90° angle (perpendicular) to the pipeline. This factor needs to be taken into account in the formulation of the road pattern within the vicinity of the pipeline.

There is opportunity within the 32m buffer area to utilise this land for provision of public open space and roads (reserve and pavement). Residential lot boundaries may be permitted up to the 32m buffer line.

4.2.4 Remnant Vegetation

The identification of good stands of remnant vegetation provides opportunity for the strategic selection of such areas for inclusion in public open space. The protection of some areas of remnant vegetation has obvious environmental value but may also bring an aesthetics value to the area as landscape features.

4.2.5 Poultry Farm and Market Gardens

As discussed in earlier sections, the development buffers around poultry farms and market gardens will constrain development opportunities. Given the residential development potential afforded to the area by zoning and the subsequent adoption of the District Structure Plan, it is anticipated that many of the market gardens will cease operation in favour of residential development. This also may occur to the poultry farms but given the level of capital in their operations this may not occur until the medium term.

As outlined in sections 3.5.2 and 3.5.3, there is opportunity for proponents to undertake environmental studies with the aim of securing a reduced buffer requirement, or nil buffer requirement, subject to conditions for their individual subdivision applications.

5.0 SERVICING INFRASTRUCTURE

5.1 Drainage

Given the undulating nature of the existing landform consisting of moderate to steep slopes and together with the City of Rockingham's requirement to retain the character of the landform as much as possible, the Structure Plan area has been divided into sixteen (16) topographical drainage catchments as defined in the Preliminary Drainage Catchment Plan (**Figure 13**). No major drainage channels exist within the subject land.

Given the high to medium permeability of the soil in this area, the use of retention basins is adopted throughout the development to provide for stormwater drainage retention on site. In this way, stormwater will collect in these dry basins and infiltrate into the soil, recharging the groundwater aquifer. The Structure Plan indicates likely drainage basin locations.

The subdivision drainage system will collect stormwater run off from roads, verges and residential lots, although the majority of lot drainage is expected to be contained in on-site soakwells. Resultant flows will be piped directly to the retention basins described above. These basins are to be designed to contain 1 in 10 year storm events with provision for run off generated from 1 in 100 year storm events to overflow into POS or other areas. The design of these basins will be reliant on the planning for any development within the subject area and the storage capacity of basins calculated to control outflow and perform water quality management functions by control of nutrients and recharge.

The eastern portion of the study area is within the catchment of the Mundijong Drainage District. The drainage system within this district has been constructed to rural drainage standards. Therefore the following items should be noted for development within this area:

- Drainage headworks and rates are not applicable at this time within the Mundijong Drainage District.
- Discharge from development within this catchment is limited to the pre-development level.
- Compensation must be provided on site for a 100 year recurrence interval storm event.
- Discharge from areas outside of the existing catchment should not be permitted.
- All water quality issues and also the disposal of runoff from the area outside of the Mundijong Catchment will need to be to the requirements of the Water and Rivers Commission, Department of Environmental Protection and the City of Rockingham.

5.1.1 Stormwater Management

Stormwater management design criteria should take a whole-of-catchment approach for the study area, and should be in accordance with the current objective for:

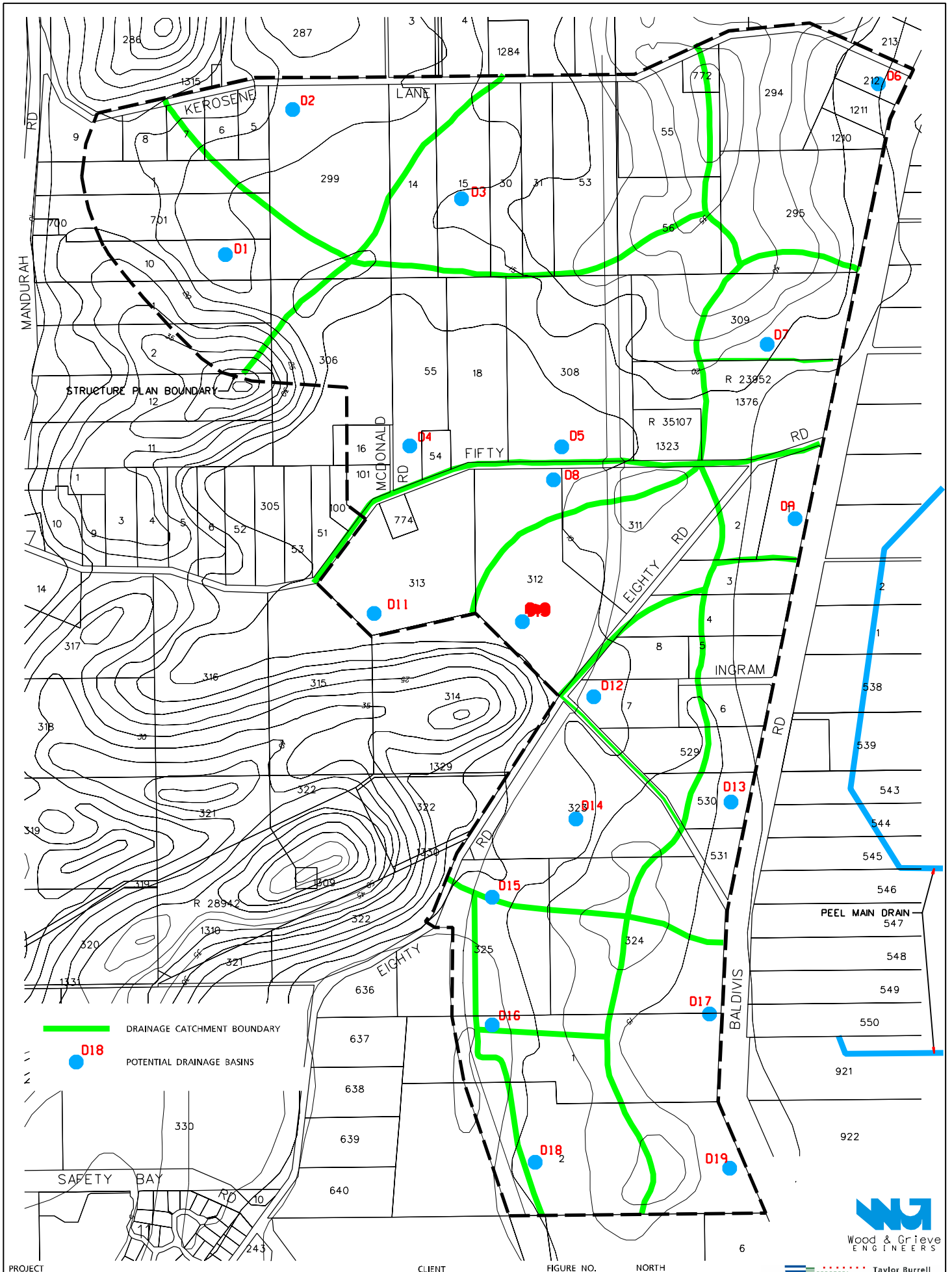
- The catchment of the Peel-Harvey Estuary; and
- Water Sensitive Urban Design Guideline - Best Management Practices (EPA 1997b, Section 3.4.1).

The design objectives of stormwater management under Comprehensive Development Plans on the on-site detention of water, with subsequent slow release to groundwater via infiltration. This approach is termed the "storage-orientated approach" preferred by the EPA (EPA, 1997b).

Active management of the local surface water catchment within the study area, such as road sweeping and litter collection, and appropriate management of treatment basins and surrounds, are important contributions which will aid the control of potential pollutants.

Stormwater disposal should be designed in accordance with water sensitive design principles to ensure:

- Containment of water from a 1 in 100 year 24 hour storm event on-site, with no direct discharge of stormwater to any wetland;



— DRAINAGE CATCHMENT BOUNDARY
● D18 POTENTIAL DRAINAGE BASINS

PROJECT: CLIENT: City of Rockingham FIGURE NO.: 13 NORTH:

**PRELIMINARY DRAINAGE
 CATCHMENT PLAN
 BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**

Wood & Grieve
 ENGINEERS
 Taylor Burrell
Town planning and design

- Treatment of stormwater from all other storm events within on-site basins, with infiltration of collected and treated stormwater from the basins to the local aquifer as recharge;
- Collection and treatment of the "first flush" stormwater event within the on-site basins annually;
- Drainage from car parks not be directed into the treatment systems, but infiltrated through localised side entry pits and gullies to promote local aquifer recharge through a piped dissipation system,; and
- Infiltration of roof rainfall run-off through localised soakage structures.

In accordance with the objectives of best management practice, it would be beneficial to appropriately design and construct the drainage systems to incorporate nutrient stripping features.

5.2 Sewerage

The Water Corporation's Wastewater Scheme Planning for Baldivis divides the study area into both the Baldivis North Sewer District and the Baldivis South Sewer District catchments. The Wastewater Scheme Plan indicates the sewerage disposal strategy utilising major pumping stations, pressure mains and gravity mains for catchments within the study area (refer **Figure 14**).

In the planning for the Baldivis South Sewer District the main pump station is the Baldivis South Pumping Station A, located in the Settler's Hills Estate. Ultimate planning for this station is to pump to the proposed East Rockingham Wastewater Treatment Plant, which is planned to be located at the intersection of Mandurah Road and Dixon Road about 5.5km from the study area. A temporary discharge point within the Settler's Hill Development would be required for development within the Baldivis South Sewer District.

The majority of the study area falls within the Baldivis North Sewer District, with the main pump station Baldivis North Pumping Station A located on Lot 312 south of Fifty Road and west of Eighty Road. This pump station will pump effluent northwards to the East Rockingham Wastewater Treatment Plant. The Water Corporation advises that the current Baldivis North Sewer District shows the ultimate concept including construction of the East Rockingham Wastewater Treatment Plant, Baldivis North Main Pumping Station and pressure mains. Until this infrastructure can be developed any initial development will require temporary works to accommodate wastewater disposal. For the Baldivis North Sewer District the temporary discharge point would be in Bertram Road in Casuarina.

Subject to satisfying the Water Corporation's criteria for headworks, we anticipate that the permanent pumping stations and pressure mains will be at the Water Corporation's cost, funded from headworks contributions and in accordance with their capital works programs. If development staging is ahead of this program or temporary works are required, these headworks would need to be funded by the developer. Reticulated sewer mains within the development would be at the developer's cost in accordance with standard Water Corporation policy.

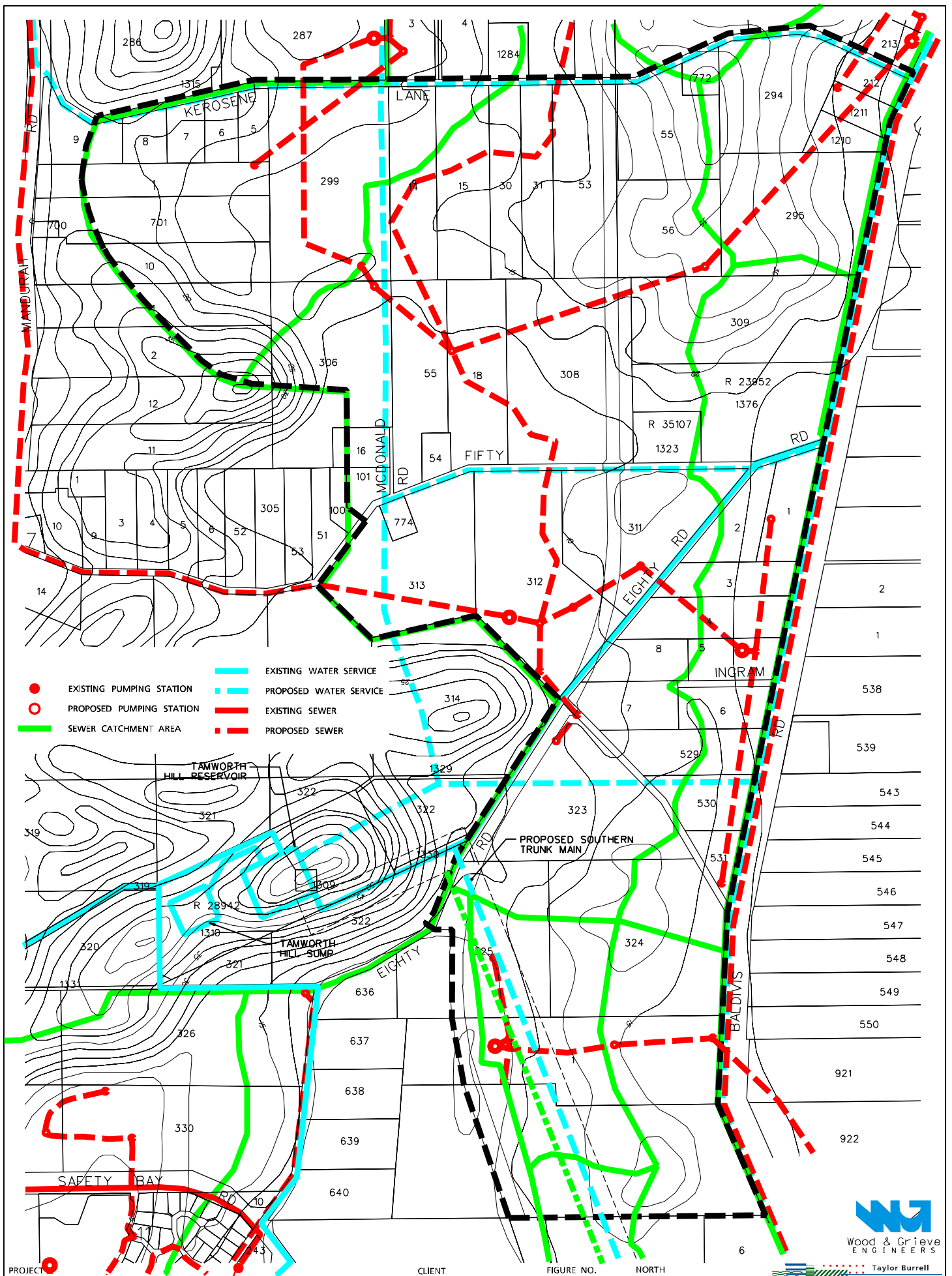
The Water Corporation's Wastewater Scheme Planning has been based on the existing topography of the study area only and therefore the alignment and position could be amended during detailed subdivision design.

5.3 Water Supply

The study area is within the Tamworth Water Supply Scheme. The Water Corporation has carried out extensive planning in this area incorporating a network of proposed distribution and reticulation mains as shown in **Figure 14**.

An existing 900mm diameter water main is located in Eighty Road, Fifty Road and Baldivis Road. The route of this existing pipeline has been preserved in the structure planning, as it is the supply main to the Tamworth Reservoir.

The Tamworth Reservoir has a top water level of about 65.0m AHD and a capacity of 216ML with a current servicing limit of approximately 30.0m to 35.0m AHD. Development in areas above 30-35m AHD would necessitate either a booster pumping system or a separate high level supply in order to maintain adequate pressures. There are two potentially affected areas which have been identified in **Figure 12**.



**SEWERAGE AND WATER SERVICES PLAN
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**

Comprehensive Development Plans should accommodate suitable routes for the distribution mains as detailed in the water servicing for the study area.

The Water Corporation has recently proposed a water trunk main to the proposed Karnup Reservoir. This main is planned to be a DN1400 and will be aligned approximately 17 metres east of the CMS Parmelia Natural Gas Pipeline.

Provision of distribution infrastructure is dependent on development. Proposed development densities and staging considerations would need to be confirmed with the Water Corporation to enable negotiations for provision of this infrastructure to proceed. It is anticipated that the provision of distribution mains will be at the Water Corporation's cost from revenue received from headworks contributions. If development staging is ahead of the Water Corporation's program, provision of these distribution mains may require pre-funding by the respective developer. Reticulation mains within the development will need to be constructed and funded by the developer in the normal manner.

The extent of temporary works would be dependent on proposed development densities and staging and would need to be negotiated with the Water Corporation.

5.4 Power Supply

Western Power has existing overhead power lines located along Mandurah Road, Baldivis Road, Kerosene Lane, Fifty Road and to a lesser extent along Eighty Road (refer **Figure 15**). There are no underground power cables within the study area. The existing and proposed power requirements are available from the Medina Zone Substation.

The existing feeder supplying the study area is approximately 14km in length and is basically an aerial feeder. In order to supply the development of the North Baldivis Area, Western Power expect that approximately 7km of the existing aerial conductor will require replacement due to inadequate capacity.

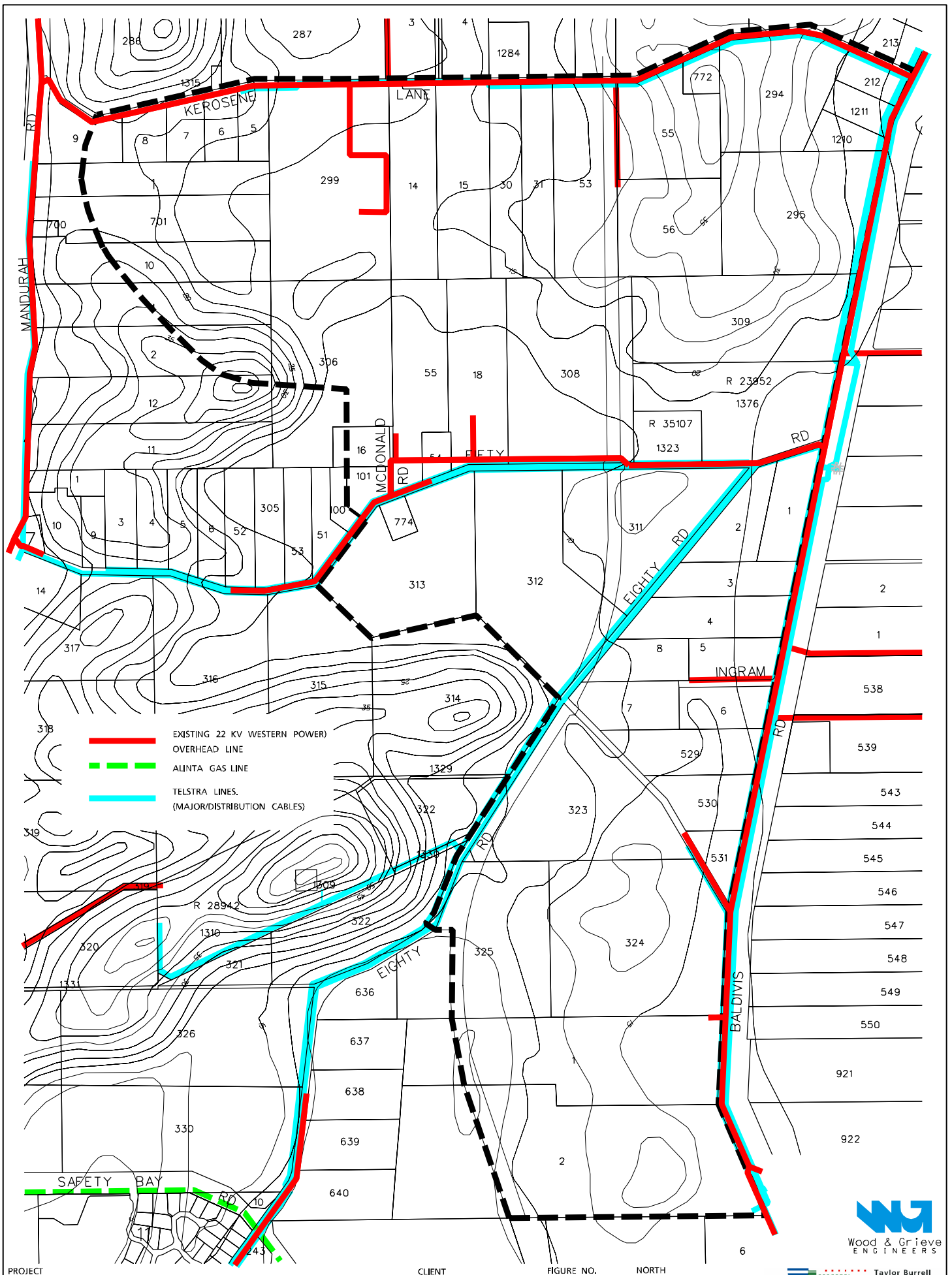
Electrical power will be distributed through the development by underground mains installed in accordance with Western Power policy and design criteria. Substation sites will be necessary throughout the development subject to staging and detailed design requirements. Power will be brought to site from the upgraded high voltage infrastructure in the area, as described above, and connected to substations within the development.

5.5 Gas Supply


The existing gas supply network for the study area is located at the corner of Safety Bay Road and Eighty Road, which currently services the Settler's Hills Estate (refer **Figure 15**).

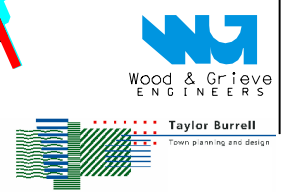
In order to supply the North Baldivis Area, a gas header main extension would have to be constructed to the proposed development. Alinta Gas would require developers to pay a capital contribution to make the gas supply project viable. The amount of this capital contribution would depend upon:

- The overall structure planning for the North Baldivis Area
- Lot Release Staging
- Availability of common trenching coordination at the time of construction



**GENERAL SERVICES PLAN
 (TELSTRA, WESTERN POWER & ALINTA GAS)
 BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**

PROJECT: CLIENT: City of Rockingham FIGURE NO.: 15 NORTH: 



6.0 STRUCTURE PLAN

6.1 Workshop Outcomes

During the formulation of the District Structure Plan, a workshop was held where landowners were invited to raise any issues which should be considered in the design of the Plan.

The following issues were raised:

- Recognition of Baldivis Primary School as a community focal point;
- General preference for the proposed neighbourhood shopping centre on or near the intersection of Nairn Drive and Fifty Road;
- Possibility of re-aligning Nairn Drive further west away from the Baldivis Primary School to reduce potential safety risk.

This issue was considered but not adopted as part of the Plan for the following reasons:

- to re-align will introduce new landowners to the problem of land acquisition;
- The timing of the process to realign would significantly delay development potential of the land and there would be no certainty as to a successful outcome;
- a buffer (approx. 50m) will exist between the school and Nairn Drive;
- no broader planning advantage in realigning Nairn Drive;
- the WAPC has previously opposed requests to realign Nairn Drive in the manner suggested above.

6.2 Design Principles

The Baldivis (North) District Structure Plan is shown in **Figure 16**.

The Structure Plan has been prepared with regard to the Liveable Neighbourhoods Community Design Codes with respect to providing a framework within which the principles of the Codes can be incorporated into the detailed planning of Comprehensive Development Plans. The main focus for the Baldivis (North) community is the centrally located neighbourhood centre.

The Plan adopts a strong linear north-south, east-west road pattern designed to encourage the use of a modified grid system at the more detailed design level. The road pattern aims to optimise vehicle and pedestrian permeability throughout the area with particular emphasis on the neighbourhood centre.

Together with the road pattern, the location of land uses aims to set in place a framework which provides an urban structure which promotes the development of walkable neighbourhoods around local focal points (eg local shops) with an employment, entertainment and community focus on the centrally located neighbourhood centre.

The Structure Plan incorporates all existing constructed roads within and adjoining the Structure Plan area.

The Structure Plan reflects the approved subdivision granted over Lot 309 Baldivis Road. The western portion of Lot 309, which was not approved due to it falling within a poultry farm buffer, has also been reflected in the Plan to ensure connectivity and surety to the landowner.

The approved CDP over lots 772, 55 and 56 Kerosene Lane has not been reflected in the Plan as the design is not compatible with the Structure Plan objectives of providing a design consistent with the principles of the Community Codes.

The District Structure Plan is conducive to accommodating the design provided under the draft CDP for Lots 306, 16, 313 and 714 Fifty Road.

Precinct 2

400m walkable catchment

Proposed primary school and associated active public open space

Walkable Catchment Node

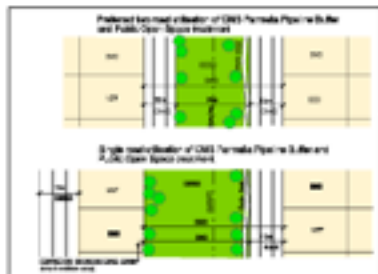
Dress Circle Lots - opportunity to design to capture long distance rural aspects

400m walkable catchment to Neighbourhood Centre

Neighbourhood Centre 5600m² min max.

Significant Tuat trees to be protected, widen road reserve to accommodate in verge

Existing wetland to be modified to create permanent lake and drainage feature encompassed within Public Open Space



PRECINCT 1	
Total Area	133,21ha
Designation	
Public Open Space (POS)	11,10ha
Public Open Space (POS) (10%)	11,10ha
Public Open Space (POS) (20%)	22,20ha
Public Open Space (POS) (30%)	33,30ha
Public Open Space (POS) (40%)	44,40ha
Public Open Space (POS) (50%)	55,50ha
Public Open Space (POS) (60%)	66,60ha
Public Open Space (POS) (70%)	77,70ha
Public Open Space (POS) (80%)	88,80ha
Public Open Space (POS) (90%)	99,90ha
Public Open Space (POS) (100%)	111,00ha
Public Open Space (POS) (110%)	122,10ha
Public Open Space (POS) (120%)	133,20ha
Public Open Space (POS) (130%)	144,30ha
Public Open Space (POS) (140%)	155,40ha
Public Open Space (POS) (150%)	166,50ha
Public Open Space (POS) (160%)	177,60ha
Public Open Space (POS) (170%)	188,70ha
Public Open Space (POS) (180%)	199,80ha
Public Open Space (POS) (190%)	210,90ha
Public Open Space (POS) (200%)	222,00ha
Public Open Space (POS) (210%)	233,10ha
Public Open Space (POS) (220%)	244,20ha
Public Open Space (POS) (230%)	255,30ha
Public Open Space (POS) (240%)	266,40ha
Public Open Space (POS) (250%)	277,50ha
Public Open Space (POS) (260%)	288,60ha
Public Open Space (POS) (270%)	299,70ha
Public Open Space (POS) (280%)	310,80ha
Public Open Space (POS) (290%)	321,90ha
Public Open Space (POS) (300%)	333,00ha
Public Open Space (POS) (310%)	344,10ha
Public Open Space (POS) (320%)	355,20ha
Public Open Space (POS) (330%)	366,30ha
Public Open Space (POS) (340%)	377,40ha
Public Open Space (POS) (350%)	388,50ha
Public Open Space (POS) (360%)	399,60ha
Public Open Space (POS) (370%)	410,70ha
Public Open Space (POS) (380%)	421,80ha
Public Open Space (POS) (390%)	432,90ha
Public Open Space (POS) (400%)	444,00ha
Public Open Space (POS) (410%)	455,10ha
Public Open Space (POS) (420%)	466,20ha
Public Open Space (POS) (430%)	477,30ha
Public Open Space (POS) (440%)	488,40ha
Public Open Space (POS) (450%)	499,50ha
Public Open Space (POS) (460%)	510,60ha
Public Open Space (POS) (470%)	521,70ha
Public Open Space (POS) (480%)	532,80ha
Public Open Space (POS) (490%)	543,90ha
Public Open Space (POS) (500%)	555,00ha
Public Open Space (POS) (510%)	566,10ha
Public Open Space (POS) (520%)	577,20ha
Public Open Space (POS) (530%)	588,30ha
Public Open Space (POS) (540%)	599,40ha
Public Open Space (POS) (550%)	610,50ha
Public Open Space (POS) (560%)	621,60ha
Public Open Space (POS) (570%)	632,70ha
Public Open Space (POS) (580%)	643,80ha
Public Open Space (POS) (590%)	654,90ha
Public Open Space (POS) (600%)	666,00ha
Public Open Space (POS) (610%)	677,10ha
Public Open Space (POS) (620%)	688,20ha
Public Open Space (POS) (630%)	699,30ha
Public Open Space (POS) (640%)	710,40ha
Public Open Space (POS) (650%)	721,50ha
Public Open Space (POS) (660%)	732,60ha
Public Open Space (POS) (670%)	743,70ha
Public Open Space (POS) (680%)	754,80ha
Public Open Space (POS) (690%)	765,90ha
Public Open Space (POS) (700%)	777,00ha
Public Open Space (POS) (710%)	788,10ha
Public Open Space (POS) (720%)	799,20ha
Public Open Space (POS) (730%)	810,30ha
Public Open Space (POS) (740%)	821,40ha
Public Open Space (POS) (750%)	832,50ha
Public Open Space (POS) (760%)	843,60ha
Public Open Space (POS) (770%)	854,70ha
Public Open Space (POS) (780%)	865,80ha
Public Open Space (POS) (790%)	876,90ha
Public Open Space (POS) (800%)	888,00ha
Public Open Space (POS) (810%)	899,10ha
Public Open Space (POS) (820%)	910,20ha
Public Open Space (POS) (830%)	921,30ha
Public Open Space (POS) (840%)	932,40ha
Public Open Space (POS) (850%)	943,50ha
Public Open Space (POS) (860%)	954,60ha
Public Open Space (POS) (870%)	965,70ha
Public Open Space (POS) (880%)	976,80ha
Public Open Space (POS) (890%)	987,90ha
Public Open Space (POS) (900%)	999,00ha
Public Open Space (POS) (910%)	1010,10ha
Public Open Space (POS) (920%)	1021,20ha
Public Open Space (POS) (930%)	1032,30ha
Public Open Space (POS) (940%)	1043,40ha
Public Open Space (POS) (950%)	1054,50ha
Public Open Space (POS) (960%)	1065,60ha
Public Open Space (POS) (970%)	1076,70ha
Public Open Space (POS) (980%)	1087,80ha
Public Open Space (POS) (990%)	1098,90ha
Public Open Space (POS) (1000%)	1110,00ha

LEGEND

- NEIGHBOURHOOD CENTRE - 50-100 DOM
- NEIGHBOURHOOD CENTRE - MIXED USE
- COMBINE TYPED LINES
- MEDIUM DENSITY HOUSING
- WALKABLE CATCHMENT NODE
Potential to include central green area, water, art, medical centre, day care centre, community facility, etc.

SAFETY BAY

Precinct 1

Suggested location of Lunch Bar in proposed Light Industrial Area
Potential Rural Service Store site
Dress Circle Lots - opportunity to design to capture rural aspect to east
Design on south side of Karosene Lane should recognise use of land north of Karosene Lane for Light Industry
Landmark Public Open Space site, Public viewpoint on high point

400m walkable catchment to potential Rural Store

Community Facilities site
Public Open Space encompassing high point

Walkable Catchment Node

Approved subdivision area, western half affected by poultry farm buffer and pending reconsideration request

Existing Public Open Space containing District Level active and organised recreation

400m walkable catchment to local shopping

Pedestrian link between Tramway reserve and Tamworth Hill

400m walkable catchment

Public Open Space to preserve remnant bushland
Retain section of Filly Road as services corridor

Precinct 3

Walkable Catchment Node
Proposed Coastal Christian Church community facilities site

400m walkable catchment

Former "Tramway" reserve

Walkable Catchment Node

Unconstructed road. Reserve to be closed

600m walkable catchment to Baldvis District Centre

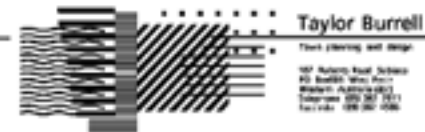
Tamworth Hill Swamp Wetland is "conservation" category wetland protected in public open space and utilised for drainage incorporating water sensitive design techniques

Public Open Space to preserve some remnant bushland and provide centrally located recreation opportunity for residential catchment

Walkable Catchment Node

Roads and road reserves and public open space within CMS buffer (see detail diagram insert)

400m walkable catchment



The draft CDP for Lots 1 and 2 Baldivis Road is not compatible with the road pattern as defined by District Structure Plan. The District Structure Plan however does incorporate the boundary of the Tamworth Hill Swamp public open space area as defined by the EPA in its Consultative Environmental Review.

6.3 Structure Plan Yields

The estimated lot yield and population projections from the Structure Plan are provided in Table 1 below.

The total Structure Plan area is 422ha. Removing the non developable areas, a total developable area of 397.22ha results. Subtracting the 10% Public Open Space requirement 39.72ha a net subdivisible area of 357.5ha remains.

It is assumed that the density of residential development will be similar to the current development of the nearby Settlers Hills. An assessment of Settlers Hills indicates a lot yield of 12 per ha net subdivisible area. The same lot yield has been applied to North Baldivis to estimate the total lot yield.

Based on a net subdivisible area of 357.5ha, it is calculated that the whole of the North Baldivis area will generate approximately 4290 lots.

The number of people per household for the Perth Metropolitan Region as registered in the 1996 Census was applied to determine the estimated total population. Applying the average of 2.7 people per household, a total population of 11,583 is estimated for the Baldivis (North) District Structure Plan area.

This estimated population generates the need for 6138m² nla of neighbourhood/ local level retail floorspace, based on the WA Planning Commission Metropolitan Centres Policy (total population x 0.53m²).

Table 1
Baldivis (North) District Structure Plan Yields

TOTAL DISTRICT STRUCTURE PLAN AREA

Total Area		422.14ha
Deductions	24.92ha	
Total Developable Area		397.22ha
Public Open Space 10%	39.72ha	
∴ Net Subdivisible Area		357.50ha
Total Lot Yield (12 **lots/ha)		4290
Total Population Yield (2.7 ***per household)		11,583
Total Retail Floorspace (0.53m ² nla per capita)		6,138m ²

Precinct 1

Total Area		123.21ha
Deductions		
Walkable Catchment Nodes	0.25ha	
Baldivis Primary School	3.17ha	
Neighbourhood Centre	0.25 ha	
Drainage (2%* total area)	<u>2.46ha</u>	
	<u>6.13ha</u>	
Total Developable Area		117.08ha
Public Open Space (10%)	11.71ha	
<u>∴ Net Subdivisible Area</u>		<u>105.37ha</u>
Lot Yield (12** lots/ha)		1264
Estimate Population Yield (2.7*** per household)		3414
Retail floorspace - local/neighbourhood level (population x 0.53m ²)		1809m ²
Public Open Space Provided (10%)		11.71ha

Precinct 2

Total Area		184.75ha
Deductions		
Neighbourhood Centre & Walkable Catchment Nodes	2.50ha	
Primary School	3.50ha	
CMS Buffer	3.62ha	
Drainage (2%* total area)	<u>3.69ha</u>	
	<u>13.31ha</u>	
Total Developable Area		171.44ha
Public Open Space (10%)	17.14ha	
<u>∴ Net Subdivisible Area</u>		<u>153.4ha</u>
Lot Yield (12 **lots/ha)		1851
Estimate Population Yield (2.7 ***per household)		4999
Retail floorspace - local/neighbourhood level (population x 0.53 m ²)		2650m ²
Public Open Space Provided (10%)		17.14ha

Precinct 3

Total Area		114.18ha
Deductions		
Walkable Catchment Nodes	0.5ha	
CMS Buffer	2.7ha	
Drainage (2%* total area)	<u>2.28ha</u>	
	<u>5.48ha</u>	
Total Developable Area		108.7ha
Public Open Space (10%)	10.87ha	
<u>∴ Net Subdivisible Area</u>		<u>97.83ha</u>
Lot Yield (12 **lots/ha)		1175
Estimate Population Yield (2.7 ***per household)		3170
Retail floorspace - local/neighbourhood level (population x 0.53m ²)		1679m ²
Public Open Space Provided (12.2%)		13.3ha (11.5%)

* based on assessment of landform and soils permeability

** based on average lot yield in Settlers Hill

*** based on Perth Metropolitan average 1996 Census

6.4 Retail Network

The projected population of the District Structure Plan generates 6138m² nla of local/neighbourhood level shopping.

Regional level shopping is provided at Rockingham City and district level shopping will be provided in the Baldivis Town Centre. This leaves two levels of shopping to be provided within the District Structure Plan, a neighbourhood centre and localised shops ie corner shops.

The neighbourhood centre is strategically positioned at the junction of Fifty Road, a local neighbourhood connector and Nairn Drive, a district distributor and central to the North Baldivis catchment. The location is adjacent to a traditional community focal point of the Baldivis Primary School, local town hall, playing fields, tennis club and various community based agencies.

The neighbourhood shopping centre has been allocated 5500m² net leasable area (nla) floorspace. The centre will provide the main community focal point within North Baldivis, providing retail, employment and entertainment opportunities.

The District Structure Plan provides six localised Walkable Catchment Nodes which allow the potential for "corner stores" to be accommodated with a floor area not exceeding 150m². These are strategically located to maximise residential catchment potential.

The Walkable Catchment Nodes primary objective is to establish local focal centres to create localised communities. While a small retail component may be permitted, other uses such as a medical centre, day care centre, or other community facilities and the like may also be permitted. The uses would be determined in the assessment of individual CDPs.

6.5 Residential Densities

Given the location of North Baldivis on the urban fringe a base R20 coding is envisaged for the area. Existing development in the vicinity (ie Settlers Hills) shows a predominance of lot sizes in the range of 660m² to 720m² which reflects the current market trend; however, there should be sufficient flexibility with adopted base density to facilitate future changes in standard lot size preferences.

A significant medium density housing area is proposed surrounding the Neighbourhood Centre in order to maximise accessibility and to promote a lively community nucleus. This area will also be provided with good access to public transport opportunities. The robust road design around the Neighbourhood Centre aims to allow for initially medium density housing with the potential for the introduction of mixed uses over time. It is envisaged that two storey residential development occur on edges of the Neighbourhood Centre where the ground floor can eventually be utilised for commercial uses, promoting the concept of "live-work". This will lead to higher provision of local job opportunities, as the community grows, further strengthening the focal centre and bringing about a greater sense of community. The densities should allow for up to R40 development, generally, increasing to R60 closer to the Neighbourhood Centre. This is a matter to be considered in the preparation of Comprehensive Development Plans.

Around each of the Walkable Catchment Nodes, or significant public open space areas, medium density housing is proposed and encouraged. It is envisaged that these be developed to a density of R30 to R40.

6.6 Mixed Use Development

A significant area of land surrounding the Neighbourhood Centre is proposed for mixed-use development.

It is envisaged that initially housing development will be constructed in areas adjacent to the Neighbourhood Centre but the design of the houses should be able to allow the ground floor to be easily converted into offices or shop fronts. This provides compatible uses with the shopping centre and an appropriate transition between pure residential and the Neighbourhood Centre. The provision of a definitive mixed-use centre will also facilitate the increasing move towards home based employment.

6.7 Primary Schools

Current Education Department Guidelines require the provision of one primary school for every 1800 lots. Based on the estimated lot and population yields, the Baldivis (North) District Structure Plan generates the need for at least two primary schools. Based on the estimated total lot yield of 4290, a total of 2.38 primary schools is required.

The Baldivis Primary School already exists within the Structure Plan area, being located on Fifty Road adjoining an open space area with developed sporting facilities. The Baldivis Primary School currently has a significant catchment area servicing the surrounding rural population and stretching as far east as Serpentine and Casuarina. The school facility is aged and contains some transportable buildings.

The geographic nature of the Structure Plan area is not conducive to supporting a well defined catchment area for a second school accepting the location of the existing Baldivis Primary School. There are two possible locations for a second proposed primary school being the central area within Precinct 2 or a central area within Precinct 3. The location of a school at either precinct would disadvantage the residents of the other precinct.

It is clear that in accepting the Baldivis Primary School in its current location, the primary school network will invariably be unbalanced in the context of the catchment, regardless of the ultimate location of the second site.

In the formulation of the Structure Plan, it was an objective to present the optimum location of primary school sites, in accordance with Education Department Policy, which are located central to, and within, clearly definable catchments. The location of the Baldivis Primary School prevents this objective from being met. In an attempt to achieve an optimum location of school sites, consideration was given to an option of providing two new primary schools, one in Precinct 2 and the other in Precinct 3 with the phasing out of the existing Baldivis School.

This option was presented to the Education Department while following consideration, resolved that 'the existing school will remain on the current site and one additional school will be required in this area.'

A report was then presented to Council (26 April 2000) in which it resolved to support the second primary school within Precinct 2.

The reasons cited in the selection of the northern location were:

- The southern precinct (3) residents will have choice of access to a proposed primary school south of Safety Bay Road.
- The northern precinct (2) does not have the opportunity to be serviced by any adjacent primary schools
- A northern position provides the opportunity to service the future Special Rural / Residential lots between the urban land and Mandurah Road.

6.8 Staging

Staging of development cannot be accurately predicted due to the number of, and aspirations of, each landowner within the Structure Plan area. In addition, the market garden, and more particularly, poultry farm buffers will impact on the timing of development in respective areas.

It is expected that the first stages of development will occur on Lots 1 and 2 Baldivis Road in the south of the Structure Plan area. These lots form part of a CDP which was considered by Council, where it is understood the land owner is keen to develop. To service this land, water distribution mains would have to be extended from existing infrastructure from Tamworth Reservoir unless existing mains to Settlers Hills could be utilised. A new pump station would have to be constructed in accordance with Water Corporation Planning ie, to pump to Baldivis South Pump Station. Most of this land, together with land immediately north, are unaffected by buffers and therefore suggests the potential for the first development front.

Lot 309 in Precinct 1 has received a partial subdivision approval but the area is remote from water and sewerage services. Adjoining lots 772, 55 and 56 Kerosene Lane have an approved CDP and the land is on the market for sale as developable residential land. These lots are likely to be developed in the short term, subject to provision of water and sewer services.

7.0 TRANSPORT AND TRAFFIC SAFETY AND MANAGEMENT

7.1 Road Network

The Structure Plan utilises all existing constructed roads, being Kerosene Lane, Ingram Road, Fifty Road, McDonald Road, Baldivis Road and Eighty Road and the proposed Nairn Drive. Nairn Drive will provide the main district/regional access function by linking the Structure Plan area with the Freeway via Mundijong Road (extensions) to the north and Safety Bay Road to the south. Nairn Drive will also provide a district function linking North Baldivis with the Baldivis District Centre. Baldivis Road will also provide alternative access to the District Centre, particularly for residents along the eastern edge of the Structure Plan area.

Kerosene Lane and Fifty Road will continue to provide the main east-west district and regional connections through the Structure Plan area. The extension of Ingram Road through to Nairn Drive will provide a localised east/west link to Baldivis Road.

Current planning proposals indicate that the Kwinana Freeway extension will be located to the east of the study area and will be the primary north-south link. The Freeway extension will impact significantly on current regional access scenarios.

It is anticipated that Nairn Drive will be constructed to dual carriageway standard using both Main Roads Western Australia and Austroads guidelines.

The Structure Plan shows the layout of the local distributor roads which have been designed with consideration of the following factors:

- Permeability and connectivity
- Promotion of legible pedestrian movement systems
- Alignments straddling lot boundaries where appropriate to promote fairness between neighbouring landowners
- Landform

The plan does not incorporate the unmade road which runs at a north-west to south-east alignment within Precinct 3 (situated below Ingram Road). Currently a dirt track is situated within the reserve providing informal access to Lots 531 and 530 and access to a house located on Lot 323. The alignment of this road reserve is not conducive to the optimum road pattern to achieve design objectives. The reserve alignment does not provide connection to any particular destinations or points of interest. The extension of Ingram Road to provide an east-west connection between Nairn Drive and Baldivis Road is favoured.

Existing roads within the study area including Kerosene Lane, Fifty Road, Ingram Road, Eighty Road and Baldivis Road area currently constructed to a rural standard and will be required to be upgraded to residential standard as development occurs.

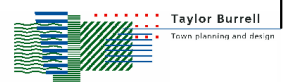
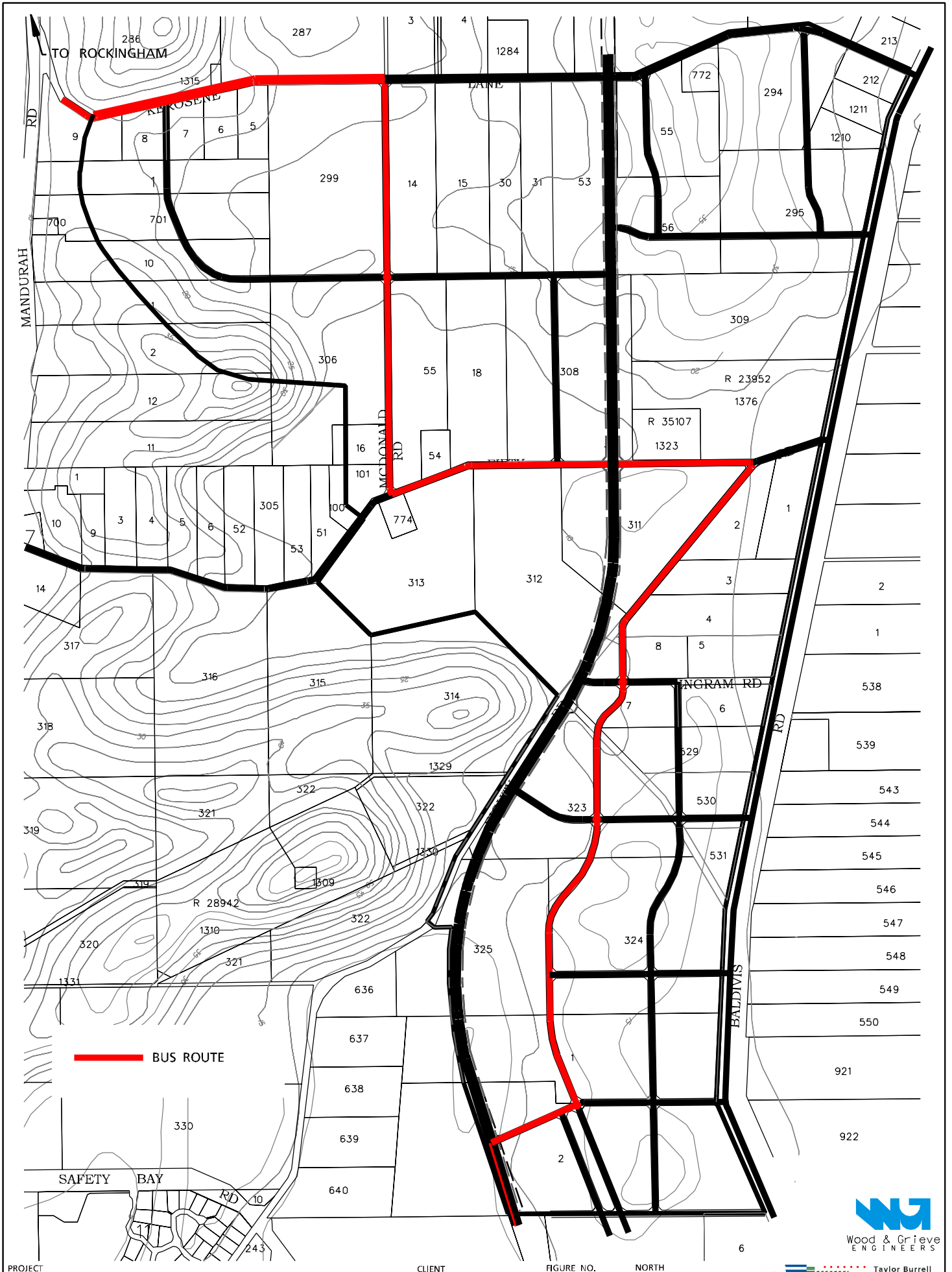
All local distributor roads have been proposed with 18m reserves. McDonald Road reserve will need to be increased from its current 10m reserve. It is recommended that the road reserve width be increased to accommodate the prominent Tuart trees on the western side, within the road verge. This will afford protection to the trees. Similarly, consideration should be given to widening Fifty Road immediately east of the intersection with McDonald to protect other significant Tuarts.

Residential development within the study area will involve construction of subdivisional roads to Local Authority urban standards including kerbed and drained pavements that will be a requirement of development. Road reserves will need to be adequate to cater for all underground services, public transport facilities and pathways.

In any detailed design phase, provision will have to be made for lowering of both the CMS Parmelia Pipeline and the Water Corporation Southern Trunk Main at Nairn Drive and internal subdivisional roads as required.

7.2 Bus Route

A bus route concept to serve the proposed Structure Plan including routes to Rockingham, Baldivis Town Centre and to Perth via the proposed Kwinana Freeway is shown in **Figure 17**.



**STUDY AREA - SUGGESTED LOCAL BUS ROUTE
BALDIVIS (NORTH) DISTRICT STRUCTURE PLAN**

It is recommended that a north - south bus route network located on the eastern side of the proposed Nairn Drive utilising Kerosene Lane and Fifty Road as east - west links be provided. It would be expected that Safety Bay Road be utilised as the major east - west link to either Rockingham or the proposed Kwinana Freeway.

Future localised bus routes should also be made available to connect the area with the proposed "South West Rail System".

7.3 Pedestrians and Cyclists

As part of the distributor and internal subdivision road design, provision for pedestrians and cyclists will have to be made in the form of dual use footpaths, crossing phases at signalised intersections and overhead walkways (if applicable). It is anticipated that the major roads will have dual use paths on both sides of the road, augmented by internal footpaths into residential areas and community facilities.

Pedestrian and cyclist facilities will need to be designed in accordance with Austroads, Bikewest and Local Authority guidelines.

7.4 Proposed Intersection Controls

The plan proposes seven intersections with Nairn Drive. All intersections are proposed as T-junctions apart from Fifty Road which is proposed as a four-way and Kerosene Lane as an eventual four-way to the northern light industrial area. The T-junctions have been planned with adequate separation distances and are proposed to be controlled by signage. The Fifty Road/Nairn Drive intersection is proposed to be signalised. This will ensure safety for access to and from the Neighbourhood Centre.

All intersections with Nairn Drive will be designed to Austroads Standards to suit dual carriageways.

All Baldivis Road intersections will need to be assessed during preparation of CDPs to determine appropriate levels of traffic control, upgrading works required to existing intersections and to provide improved entry into the study area.

The road system has been designed to limit the number of four way intersections. Where four way intersections have been proposed roundabouts are recommended. All internal road intersections will need to be designed in accordance with Austroads and Council's engineering requirements at the CDP stage.

8.0 PUBLIC OPEN SPACE

8.1 Background

It is Policy of the WA Planning Commission to require 10% of the gross subdivisible area of a residential estate to be given up free of cost to the Crown as public open space. The requirement is an accepted standard in the land development industry and ensures that future residents are provided with recreational opportunities as would be expected as part of the amenities provided in any residential area. The public open space in almost all cases is vested in the local authority in which land falls, for its development, control and maintenance.

The gross subdivisible area is determined by deducting any major non-residential land uses from the total land development area. Such non-residential uses typically include major drainage, commercial centres, schools and Regional Open Space.

8.2 Public Open Space Schedule

The Public Open Space Schedule is presented below on a Precinct basis in **Table 2**.

The Structure Plan provides a self contained 10% minimum provision for each of the three precincts. The location of the public open space has been determined in consideration of the following factors:

- protecting areas of notable remnant vegetation;
- protecting identified wetland areas (EPP Policy);
- locating sufficiently sized active areas for organised sports adjoining primary schools;
- setting aside elevated locations for community focal point and view platforms;
- utilisation of CMS pipeline buffer;
- geographic distribution to achieve acceptable walkable distance for all residential areas;
- central locations within cells to maximise accessibility;
- create a range of open space opportunities from passive to active
- incorporate drainage requirements.

Due to the level of planning at the district level all areas of public open space have been proposed at 5000m² or over in accordance with the City of Rockingham's Public Open Space Policy.

The District Structure Plan denotes, where appropriate, the purpose for which a public open space area has been provided. Where no nomination exists the public open space area has simply been provided in a central location to a cell for the purposes of meeting the 10% allocation. While 10% allocation has been provided for each Precinct, there is opportunity under the preparation of a CDP, for the distribution and possibly the location of public open space to be modified. Such modifications would need to be justified and accepted by Council. In any event, modification should only be supported where the subject public open space area has not been nominated for a specific purpose, unless that purpose is not prejudiced by the modification. The acceptance of modifications will allow for the introduction of smaller scale parks (ie. pocket parks) which is considered desirable in the local context. Any modifications to the location or distribution of public open space will still need to achieve 10% provision for the relevant Precinct.

There are no recommendations for the Council to accept any cash-in-lieu provision for any identified public open space area within the Structure Plan area.

The existing open space area adjoining Baldivis Primary School has been credited as part of the 10% provision. The provision has been allocated on a proportional (area) basis between each of the three precincts. Notwithstanding the above, each precinct is required to provide the standard 10% POS provision. Where it is not proposed to allocate the full amount of POS (in a physical sense), Council will consider accepting cash in lieu for the balance in accordance with its Policy.

There are no areas within the Structure Plan which have been determined as having regional environmental significance to warrant Regional Open Space dedication.

TABLE 2 - POS SCHEDULE

Precinct 1		123.21 ha
Less Deductions		
Baldivis Primary School	3.17 ha	
Walkable Catchment Nodes	0.25 ha	
Neighbourhood Centre	0.25 ha	
Drainage (2%)	<u>2.46 ha</u>	
TOTAL	6.13 ha	
Total Developable Area		117.08 ha
Public Open Space Requirement (10%)		11.71 ha
Public Open Space Provided		11.71 ha
(% allocation of existing POS to Precinct 1 - 4.02 ha)		
Precinct 2		184.75 ha
Less Deductions		
Primary School	3.50 ha	
Neighbourhood Centre	2.50 ha	
Walkable Catchment Nodes		
CMS buffer (50%)	2.62 ha	
Drainage (2%)	<u>3.69 ha</u>	
TOTAL	13.31 ha	
Total Developable Area		171.44 ha
Public Open Space Requirement (10%)		17.14 ha
Public Open Space Provided		17.14 ha
(% allocation of existing POS to Precinct 2 - 6.03ha))		
Note: CMS 32m Buffer	- 50% credit of area as deduction - 50% credit if developed towards 10% POS contribution	
Precinct 3		114.18 ha
Less Deductions		
Primary School	3.50 ha	
Walkable Catchment Nodes	0.50 ha	
CMS buffer (50%)	2.71 ha	
Drainage (2%)	<u>2.28 ha</u>	
TOTAL	9.69 ha	
Total Developable Area		108.79 ha
Public Open Space Requirement (10%)		10.87 ha
Public Open Space Provided (12.2%)		13.33 ha
(% allocation of existing POS to Precinct 3 - 3.73 ha)		
Note: CMS 32m Buffer	- 50% credit of area as deduction - 50% credit if developed towards 10% POS contribution	

8.3 Public Open Space Provision within CMS Parmelia Pipeline Reserve

The Structure Plan proposes the allocation of some of the public open space provision within the CMS Parmelia Pipeline 32m buffer area. It is recommended that Council accept some of the 10% provision within the pipeline buffer subject to the preparation of a landscape plan and commitment to develop by the landowners.

Under current Western Australian Planning Commission practice a 50% credit is generally accepted for all land provided as public open space within a gas pipeline 32m buffer, towards the required 10% provision.

In the subject case, the provisions of public open space within the CMS Parmelia Pipeline buffer will represent a significant proportion of the overall public open space allocation. Under these circumstances, Council will grant a 50% credit only where the public open space is landscaped and developed to the satisfaction of the Council, at the developer's cost.

Given the linear shape there is potential for the open space to be developed as a landscape feature, including passive open areas and pedestrian / cycle paths, and other semi-active areas. An indicative design is provided by insert on the Structure Plan.

Given the 32m buffer removes any residential development potential, and only 50% of it (maximum) can be allocated towards the public open space contribution, the balance 50% has been accepted as a 'deduction' under the POS Schedule.

8.4 Tamworth Hill Swamp - Precinct 3

Nairn Drive severs Tamworth Hill Swamp leaving a portion within Precinct 3. A portion of Tamworth Hill Swamp is a "conservation" category wetland under the Wetlands Atlas, where conservation must be afforded.

The Environmental Protection Authority undertook a formal assessment of a subdivision proposal over Lots 1 and 2 Baldivis Road. The subdivision proposal reflects the draft CDP prepared over the land. The Consultative Environmental Review (CER-Bulletin 939) accepted the design in terms of the allocation of public open space over the wetland area located on Lots 1 and 2. The CER required the protection of a paperbark thicket and accepted the use of some of the area for drainage subject to it meeting the Guidelines for Water Sensitive Urban Design.

The District Structure Plan adopts the public open space boundary as approved by the CER. Additional public open space is also provided over the wetland area on Lot 325 which adjoins Lot 1 to its north.

In accordance with the subdivision plan and CER for Lots 1 and 2 the total amount of public open space allocated to the wetland area west of the CMS pipeline is 5.4ha which represents about 5.0% of the required public open space provision for Precinct 3. This amount, together with public open space provided within the CMS Pipeline buffer (2.18ha), results in a 7.0% provision of public open space.

Council, in its consideration of the Comprehensive Development Plan for Lots 1 and 2 Baldivis Road, which provided the majority of the public open space provision within the CMS Pipeline Buffer and Tamworth Hill Swamp, resolved that the CDP Plan would need to include additional public open space central to its residential catchment. Pocket parks have been provided in both Lots 1 and 2 in accordance with Council's requirements.

In order to provide an equitable distribution of useable public open space to all sectors of Precinct 3, additional public open space has been provided beyond the 10% requirement. The total provision of 13.33 ha represents a 12.2% POS provision.

It is recommended that the cost of provision of the additional public open space be borne equally by all landowners within Precinct 3. A matter which can be co-ordinated in the Cost Sharing arrangements.

9.0 IMPLEMENTATION

9.1 Adoption of Structure Plan

Following the adoption of the Baldivis (North) District Structure Plan by the Council the Plan is to be referred to the WA Planning Commission for endorsement.

Following the Commission's endorsement, the Plan will provide a guide for the preparation of Comprehensive Development Plan's for local precincts or cells. The Comprehensive Development Plans will need to have regard to the broad structure of land use and the design principles and philosophies of the Baldivis (North) District Structure Plan but will not be restricted to follow the exact design and location of roads and land uses. Any departures from the Structure Plan will, however, need to be appropriately justified and will need to be acceptable to adjoining landowners, particularly where design changes affect neighbouring properties. Where modifications are proposed by a Comprehensive Development Plan, neighbour consultation will be required prior to its determination by Council.

The steps in the process from adoption to physical development are as follows:

- Rezoning of Urban Deferred areas to Urban under the MRS.
- Rezoning from Rural to Development Zone under the Local Authority Scheme supported by the preparation of a Comprehensive Development Plan in accordance with Council requirements.
- Subdivision approved by the WAPC.

It should be noted that some land within the Structure Plan area has already passed beyond some of the steps mentioned.

9.2 Infrastructure Cost Sharing

In view of the fragmented land ownership within much of the Structure Plan area, it is difficult to distribute community infrastructure in a way that all owners are equally affected. Council has considered the implementation of a mechanism to share the cost of infrastructure provision equitably between all landowners through developer contributions. There are a number of methods available to coordinate development across fragmented ownerships; however, they typically fall under one of three main classifications:

- Development Town Planning Schemes
 - (i) Resumptive Development Schemes
 - (ii) Guided Development Schemes
- Structure Plan and generic cost sharing provisions incorporated into District Zoning Schemes
- Private land pooling schemes

Whichever method is ultimately adopted, it will be necessary to determine the requirement for, and cost of, the provision of community infrastructure, so that such requirements and costs can be distributed among landowners/developers in a fair and equitable manner.

The increasing trend towards the use of generic scheme provisions has led the MfP to draft a set of model text provisions, in an endeavour to promote a consistent and standardised approach to the process.

The format of the Structure Plan has been specifically designed to serve as a framework for the determination of such infrastructure requirements (not including internal subdivisional works, which will remain the responsibility of individual landowners/developers).

As part of the process of introducing an infrastructure cost sharing mechanism, specifically related to (one or more of) the Baldivis (North) Development Precincts, it will be necessary to undertake a more detailed assessment of servicing requirements and land requirements for community infrastructure such as public open space, which can then be translated into cost estimates. The total infrastructure cost requirements can then be apportioned on a pro rata basis between landowners/developers both within the individual cells, as well as between cells.

The implementation of cost sharing mechanisms need not place an obligation on owners within a cell to enter into such a scheme; in the event that a substantial portion of a cell is owned or acquired by a single entity, whereby development may be achievable without the need for infrastructure cost sharing arrangements, then Council may consider precluding that precinct from a cost sharing scheme. It may, however, still be necessary to impose some contribution requirement in relation to infrastructure items which are shared between development precincts.

Due to the complexity of the infrastructure cost sharing process, Council commissioned a study of cost sharing mechanisms. These study outcomes, produced in a report titled Development Coordination Mechanisms - Overview Report (Taylor Burrell 2000) identified the key objectives and principles which should be embodied in any such mechanism. On the basis of the recommendation of the study. Council has commenced action on the preparation of infrastructure cost sharing provision suitable for application in Baldivis (North).

The issue of infrastructure cost sharing provisions is separate to that of the process of Structure Plan formulation, and regardless of whether or not cost sharing arrangements are implemented, the need for the adoption of a coordinated development framework, in the form of the Structure Plan, is necessary, in order to ensure that planning, development, and infrastructure provision, is undertaken in a coordinated manner.

9.3 Local Authority Rezoning / Comprehensive Development Plan

Apart from Lots 1 and 2 Baldivis Road (Mitchell Goff – CDP) and Lots 772, 55 and 56 Kerosene Lane and Lot 309 Baldivis Road (Development Planning Strategies – Comprehensive Development Plan and subdivision) all land is still zoned Rural under Council's Town Planning Scheme No. 2 and is therefore required to be rezoned to 'Development Zone' under Council's Scheme before residential development can occur.

Subject to land being zoned Urban under the MRS, a landowner may seek to rezone their land from "Rural" under the Council's Scheme to "Development Zone". Once the land is zoned "Development Zone", a proponent will be required to prepare a CDP in accordance with Council's Scheme Provisions before subdivision can proceed. The extent of the CDP will be required to cover a precinct or neighbourhood area to ensure connectivity over current lot boundaries. Proponents should negotiate the extent of a CDP area with Council's Planning Department prior to initiation.

The purpose of a CDP is to provide a more detailed examination of constraints/opportunities and to provide a more detailed design plan at a local scale, responsive to the WA Planning Commission subdivisional design requirements.

Matters of detail which may need to be addressed in the Comprehensive Development Plan reports include:

- Environmental assessment of use of the buffer areas of CMS Parmelia Pipeline
- Commitment to development of public open space within CMS Parmelia Pipeline reserve
- Dynamic olfactometry assessment where a reduced poultry farm buffer is proposed
- Environmental assessment where a reduced market garden buffer is proposed
- Treatment of interface between residential uses south of Kerosene Lane and light industry to the north
- Treatment of areas noted as elevated locations
- Road connections to proposed Special Residential area adjoining the western boundary north of Fifty Road
- Treatment of wetland areas and provision of drainage facilities with Water Sensitive Design principles
- Detailed design of roads and road intersection treatments
- Consultation with Department of Aboriginal Affairs to determine whether Aboriginal sites exist.

Upon a CDP being approved, subdivision approval may be granted by the Western Australian Planning Commission.

APPENDIX 1
People or Companies Who Own Land Within
the Structure Plan Area

People or Companies Who Own Land Within the Structure Plan Area

Precinct 1

Mr P & Mrs M Cullinane
Mr M Moriarty
Mr J & Mrs S Davies
Mr D & Mrs D Bosveld
Stein Developments Pty Ltd
Atchison E Pty Ltd
Laud Pty Ltd
Balmoral Custodians Pty Ltd
Education Department
Mr G Lilburne
Mr A Ingram
Vysell Pty Ltd
Mr P & Mrs R Garnett
Mr R & Mrs M Cutts
Mr H Carter

Precinct 2

Mr B & Mrs D Morzenti
Mr J Cahill
Messrs A & V Galati
Mr T & Mrs Z Antoluv
Mr P & Mrs B Grubelich
Mr W Radonich
L Paulik
Mr W & Mrs V Humphreys
Mr E B England
Mr F Williams
Free Reformed Church of
Rockingham Inc.
Mr L & Mrs L Brkusich
Mr L Giglia
Mr G Ivankovich
Mr H Ewell & Ms S Ivankovich
Nazer Pty Ltd
Ms M Feast
Mr W & Mrs V Cowlin
Greaves Farms Pty Ltd

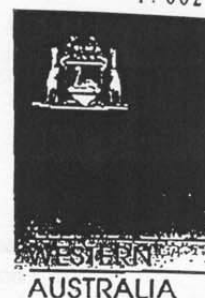
Precinct 3

Mr S Marks
Coastal Christian Life Centre Inc
Mr G & Mrs K Thomas
Messrs G & G Grimminck
Mr D & Mrs I Moore
Mr R & Mrs P Lukatelich
Nazer Pty Ltd
Karinya Nominees Pty Ltd
Benara Pty Ltd & Dalecen Pty Ltd
Mr A Shearwood

APPENDIX 2
Education Department Letter

Your Ref. 28/3911 SB:MW
 Our Ref. 475/93 VO1
 Enquiries H Barnett
 Branch Facilities Policy & Planning

Chief Executive Officer
 City of Rockingham
 P O Box 2142
 ROCKINGHAM DC 6967



151 ROYAL STREET
 EAST PERTH WA 6004
 TELEPHONE (08) 9264 4111
 FACSIMILE (08) 9264 5000
 TTY (08) 9264 4644

L
 (Attention: Sally Birchhead)

LOCATION OF GOVERNMENT PRIMARY AND SECONDARY SCHOOL SITES - BALDIVIS URBAN AREA

I refer to your letter of 23 December 1997 and our subsequent meeting of 29 January 1998 regarding the number and location of school sites to serve future residential development in the Baldvis area.

Based on a potential lot yield of 3730 lots in North Baldvis (north of Safety Bay Road), an additional primary school site to supplement the existing Baldvis Primary School (which is to be increased in site size) will be required.

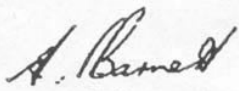
The 1993 Baldvis Structure Plan (south of Safety Bay Road) predicts a potential of 8356 lots, which may be increased in density if the Ministry of Planning's Community Codes is adopted.

Accordingly, the Education Department (EDWA) considers it will still require the 6 primary school sites, as shown on the existing plan, to serve the area. It should be noted that EDWA has accepted a relocation of the proposed Settlers Hill Primary School site to the south of the existing Tranby College.

The overall North Baldvis and Baldvis area will require the provision of 1.5 high school sites. The site shown on the plan to the south of Safety Bay Road should be retained in this area, although the specific location on the plan shows a significant wetland area which should be avoided unless comprehensive drainage is proposed.

Because of the long term requirement of any second high school, it is proposed that the site near Sixty Eight Road be relocated east of the Department of Conservation and Land Managements land holding (zoned urban) and placed on the Urban Deferred land as shown.

Please do not hesitate to contact this office should you wish to discuss the matter further.

for 
MANAGER
FACILITIES POLICY AND PLANNING

4 February 1998