

lots 23 & 800 moloney street, karloo local structure plan

PREPARED FOR ESTATES DEVELOPMENT COMPANY

JUNE 2015

Title	Lots 23 and 800 Moloney Street, Karloo Local Structure Plan
Project	Karloo Local Structure Plan
Prepared for	Estates Development Company
Reference	EDC OLD
Status	Draft
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Date of Release	June 2015
Author	R. Darby
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Approved by	R. Darby

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STRUCTURE PLAN ENDORSEMENT STATUS

Certified that the agreed Structure Plan No. was adopted by resolution of the Western Australian Planning Commission on 16 JUNE 2015.....

Signed for and on behalf of the Western Australian Planning Commission

[Handwritten signature]

An officer of the Commission duly authorised by the Commission pursuant to section ²⁴16 of the Planning and Development Act 2005 for that purpose, in the presence of:

Witness M. Wieclaw.....

Date 28 July 2015.....

And by resolution of the Council of the City of Greater Geraldton on 28 October 2014.....

And the seal of the City of Greater Geraldton was pursuant to the Council's resolution hereunto affixed in the presence of:

[Handwritten signature] Mayor

Mayor, City of Greater Geraldton

[Handwritten signature]

Chief Executive Officer, City of Greater Geraldton

Date 4-11-14.....



This Structure Plan is prepared under the provisions of Part 5 of Town Planning Scheme No. 5.

Record of Amendment made to the Agreed Structure Plan No.

Lots 23 and 800 Moloney Street, Karloo Local Structure Plan

Modification No.	Description of Modification	Endorsed by Council	Endorsed by WAPC
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EXECUTIVE SUMMARY

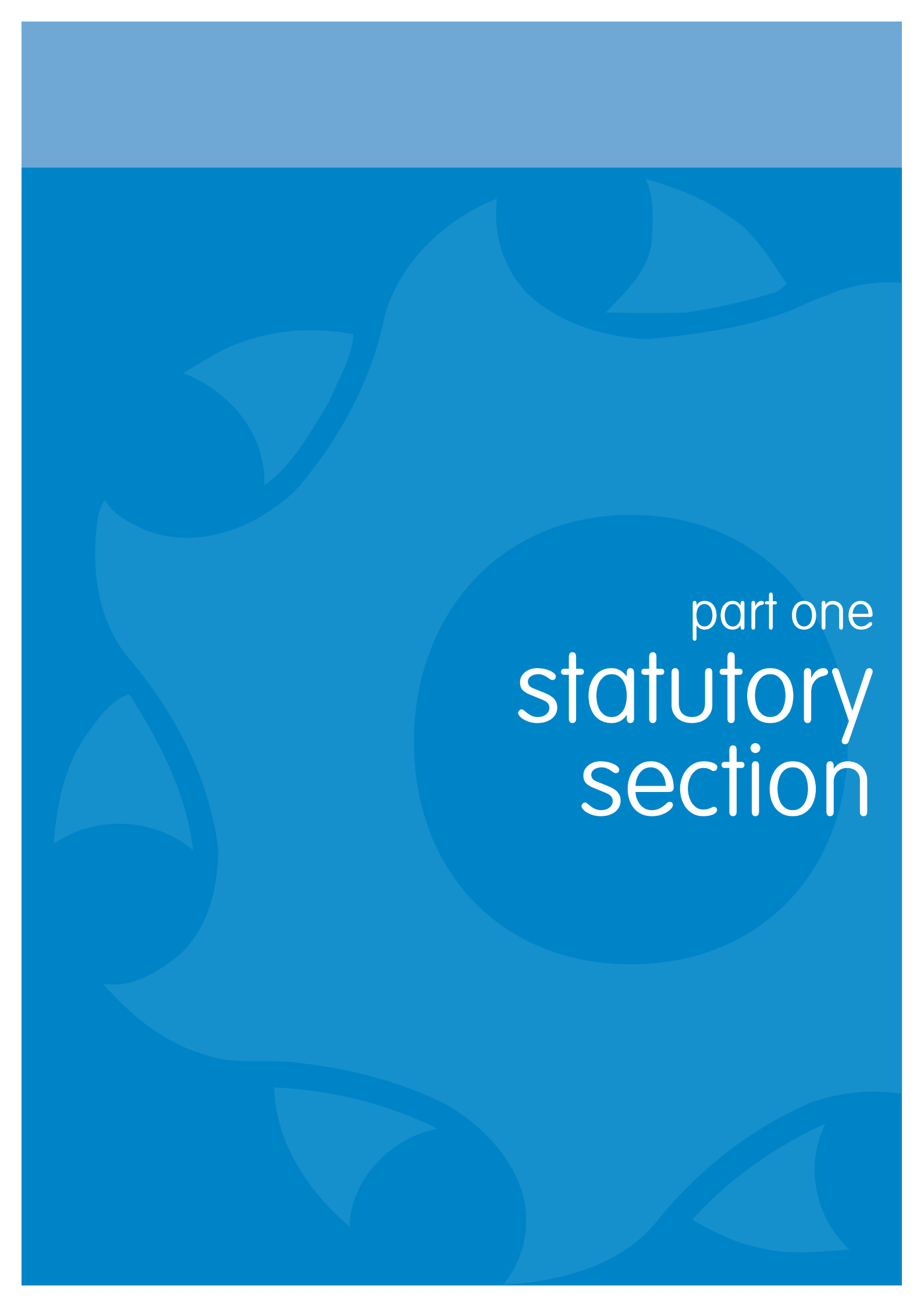
This Local Structure Plan (LSP) is prepared over Lots 23 and 800 Moloney Street, Utakarra.

The LSP proposed the subdivision and development of land for residential and light industry.

STRUCTURE PLAN SUMMARY TABLE

Item	Data	Section number referenced within the structure plan report
Total area covered by the structure plan	145.8ha	Section 1.2.2
Area of each land use proposed:		Section 1.2.2
Residential	39.75ha	
Light Industry	51.38ha	
Public Open Space	10.21ha	
Estimated lot yield		
Residential	620	Section 3.0
Light Industry	44	
Estimated number of dwellings	620	Section 3.0
Estimated residential site density	15.8du/ha	Section 3.0
Estimated population	1426 ¹	Section 3.0
Number of high schools	0	Section 3.0
Number of primary schools	0	Section 3.6
Estimated retail floor space	0	Section 3.6
Estimated number and % of public open space:	9 parks 10.21ha	Section 3.5
Estimated area and number:		Section 3.4
Neighbourhood and Local Parks	8.81ha	
Estimated number and area of natural area and biodiversity assets	2.4ha	Section 3.4

¹ Based on 2.3 residents per dwelling

The background is a solid blue color. It features several abstract, overlapping shapes in various shades of blue, including circles and teardrop-like forms, creating a layered, organic effect. A large, solid blue circle is positioned in the lower right quadrant, serving as a backdrop for the text.

part one
statutory
section

01 part one: statutory section

1.0 Structure Plan Area

This Structure Plan shall apply to Lots 23 and 800 Moloney Street, Karloo being the land contained within the inner edge of the line denoting the Structure Plan boundary on the Structure Plan Map (Plan 1).

2.0 Structure Plan Content

This Structure Plan comprises the:

- a) Statutory Section (Part 1);
- b) Explanatory Section (Part 2); and
- c) Appendices - Technical Reports.

3.0 Interpretation

Unless otherwise specified in this part, the words and expressions used in this Structure Plan shall have the respective meanings given to them in the City of Geraldton Local Planning Scheme No. 5 (the Scheme) including any amendments gazetted thereto.

4.0 Operation Date

In accordance with clause 5.17.12.1 of the Scheme, this Structure Plan shall come into operation on the day on which it is endorsed by the Western Australian Planning Commission (WAPC) pursuant to clause 5.17.10.2 of the Scheme.

5.0 Relationship with the Scheme

Pursuant to clause 5.17.12.2 and 5.17.12.3 of the Scheme:

- a) If a provision of the structure plan is inconsistent with a provision of the Scheme, then the provision of the Scheme prevails to the extent of the inconsistency; and
- b) The provisions of the structure plan apply to the land as if its provisions were incorporated into the Scheme and it is binding and enforceable in the same way as corresponding provisions incorporated in the Scheme.
- c) Part 2 of this Structure Plan and the Appendices - Technical Reports are to be used as a reference only to clarify and guide interpretation and implementation of Part 1.

6.0 Land Use and Subdivision

The Structure Plan Map (Plan 1) outlines land use, zones and reserves applicable within the Structure Plan area. The zones and reserves designated under this Structure Plan apply to the land within it as if the zones and reserves were incorporated into the Scheme.

6.1 Land Use Permissibility

The Structure Plan designates zones and reserves to the proposed development, as shown on the Structure Plan Map (Plan 1). The intention of zones and reserves and land use permissibility within the Structure Plan Area shall be in accordance with the corresponding zone or reserve under the Scheme, except as follows.

6.1.1 Light Industry

Land use permissibility shall be in accordance with the 'Light Industry' zone of the Scheme with the exception of the following restricted uses, which are NOT PERMITTED:

- Consulting Rooms
- Industry Cottage
- Motel

6.2 Specific Subdivision requirements

6.2.1 Light Industry

Subdivision shall generally be in accordance with the Structure Plan Map (Plan 1) with a minimum lot size of 5,000m².

6.3 Residential

6.3.1 Dwelling Target

- a) Objective
To provide for a minimum of 620 dwellings within the Structure Plan area.

6.3.2 Density

The Structure Plan Map (Plan 1) defines the residential density ranges that apply to specific areas within the Structure Plan area.

6.4 Public Open Space

Public open space is to be provided generally in accordance with the Structure Plan Map (Plan 1) and Table 1.

Table 1: Public Open Space Schedule

PUBLIC OPEN SPACE	AREA (HA)
Conservation (8B)	2.4ha
Local Open Space (1)	0.1318ha
(2)	0.7300ha
(3)	1.4040ha
(4)	1.7641ha
(5)	0.8916ha
(6)	1.0227ha
(7)	0.4166ha
(8A)	0.3500ha
(9)	0.3034ha
(10)	0.7000ha

6.5 Reports/Strategies Required Prior to Subdivision

Prior to the lodgement of subdivisions the following management plans are to be prepared, as applicable, to the satisfaction of the relevant authority and provided at the time of subdivision:

- a) Prior to any subdivision application being lodged in excess of 4 years from the operation date of the structure plan (as defined in section 4.0), an updated Traffic Report shall be prepared. Thereafter, any further subdivision application shall be accompanied by a Traffic Report not greater than 4 years old; and
- b) A Transport Noise Assessment shall be prepared in accordance with the WAPC State Planning Policy 5.4 'Road Rail Transport Noise and Freight Considerations in Land Use Planning' to determine the effects on the proposed residential lots of noise associated with the operations of the Geraldton Southern Transport Corridor (road and rail); and
- c) A Transport Noise Assessment should the North South Highway be constructed prior to subdivision of the land.

6.6 Conditions of Subdivision Approval

- a) At the time of subdivision, conditions may be recommended, as applicable, requiring the preparation and/or implementation of the following strategies:
 - i) The implementation of the recommendations in the Transport Noise Assessments referred to in clause 6.5(b)(c) (City of Greater Geraldton)
 - ii) Urban Water Management Plan, inclusive of the following:
 - Detailed permeability testing undertaken below the design invert depth of the basin(s) to demonstrate infiltration potential; and
 - full drainage calculations for swales, kerb/pipe/pit and basin network detailing:
 - Sizing methodology and basin(s) details.
 - Hydrology, including catchments, runoff coefficients, intensities and times of concentration.
 - Hydraulic calculations, including Hydraulic Grade Line (HGL) design long-sections to demonstrate design immunities. (City of Greater Geraldton, Department of Water); and
 - iii) No light industrial lots will be created until such time as the east-west Neighbourhood Connector road (future Ross Ariti Road extension) is built that connects the site with Abraham Street to the west.
 - iv) Notification on title advising prospective purchasers of the restrictions regarding wastewater disposal.

01 **part one:** statutory section

7.0 Development

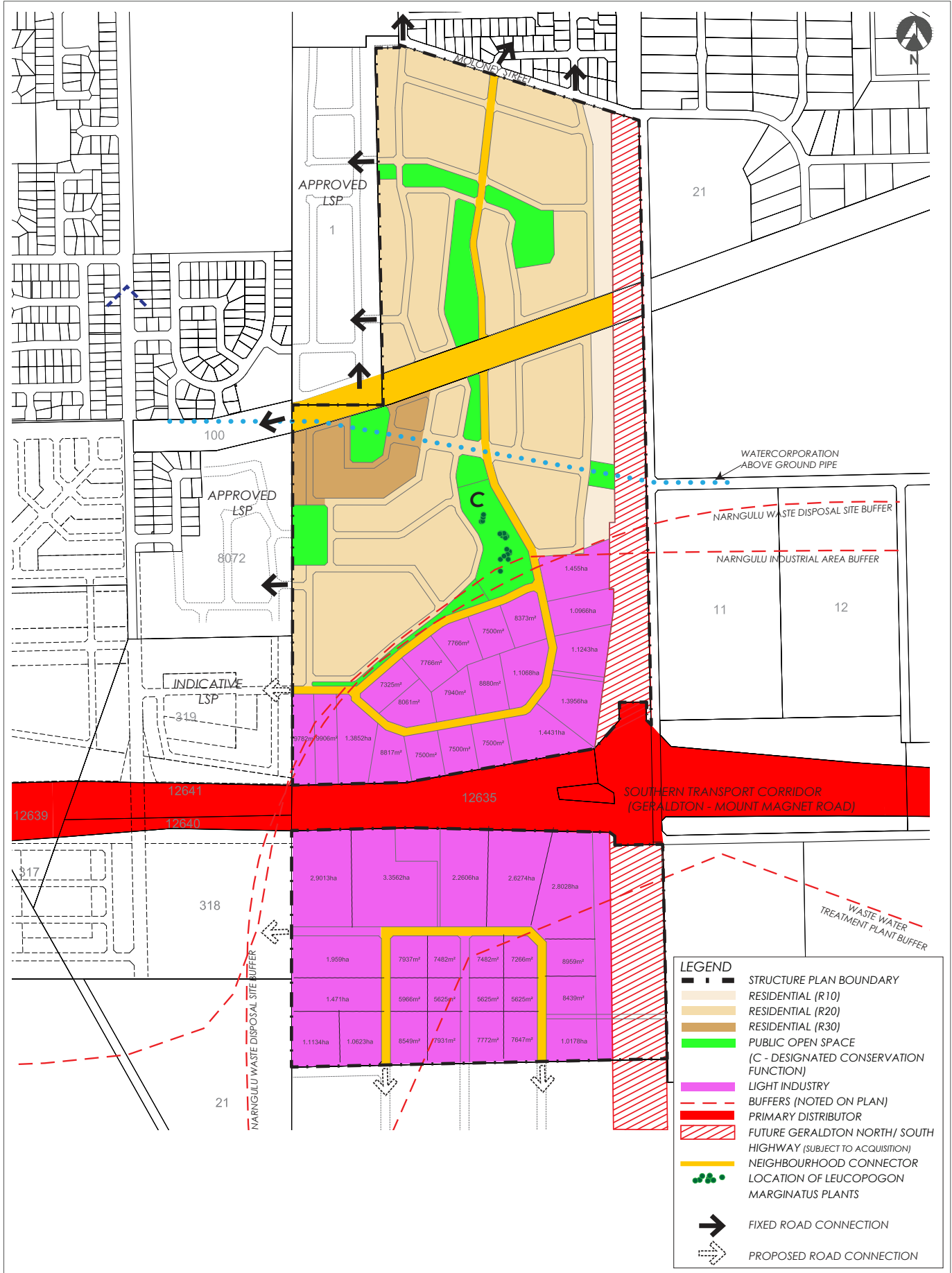
7.1 Detailed Area Plans

Detailed Area Plans are to be prepared in accordance with Clause 5.17.15 of the Scheme, prior to any development for:

- a) Any residential lots with access to a laneway;
- b) 'Light Industry' Zone; to ensure the identification and protection of any vegetation on the site worthy of retention (primarily *Bankasia prionotes*, *Melaleuca cardiophylla*, *Diplolaena grandiflora* and *Grevillea argyrophylla*) that is not impacted by subdivisional works.
- c) Any residential lots that are identified as requiring acoustic amelioration by the Transport Noise Assessment prepared under clause 6.5(b)(c); and
- d) Any other lot that requires specific development standards as identified by the City, the Department of Planning or the subdivider.

01 part one: statutory section

PLAN 1 - LOTS 23 AND 800 MOLONEY STREET LOCAL STRUCTURE PLAN



The background is a solid blue color. It features several large, overlapping, abstract white shapes that resemble stylized leaves or petals. These shapes are scattered across the page, with some appearing as outlines and others as solid white areas. The overall aesthetic is clean and modern.

part two
explanatory
section

contents_

part two explanatory section

1.0 Planning Background

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- 3.7 Movement Network
- 3.8 Water Management
- 3.9 Infrastructure Coordination, Servicing and Staging

4.0 Implementation

- 4.1 Staging
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part three technical appendices

Appendix A:

Local Water Management Strategy
(Coterra, 2014)

Appendix B:

Environmental Assessment Report
(Coterra, 2014)

Appendix C:

Traffic Report
(Riley Consulting, 2014)

Appendix D:

Civil Servicing Report
(Wood and Grieve Engineers, 2014)

Appendix E:

Geotechnical Report
(Douglas Partners, 2014)

Appendix F:

Bushfire Hazard and BAL Assessment
(Strategen, May 2015)

02 part two: explanatory section

FIGURE 1: REGIONAL CONTEXT



02 part two: explanatory section

1.0 PLANNING BACKGROUND

1.1 Introduction and Purpose

This Local Structure Plan has been prepared by Roberts Day on behalf of Estates Development Company (EDC), the proprietor of Lot 800 Moloney Street, Utaqarra and Main Roads WA, the proprietor of Lot 23 Moloney Street, Utaqarra (the 'site').

The purpose of this LSP is to facilitate the subdivision and development of the site.

1.1.1 Project Team

The LSP site is to be developed by EDC.

Other members of the Project Team include:

- Roberts Day - Urban Design + Statutory Planning
- Wood + Grieve - Civil Engineering
- Coterra - Environment + Hydrology
- Riley Consulting - Transport + Traffic

1.2 Land Description

1.2.1 Location

Regional Context

The site is situated within the City of Greater Geraldton, in the locality of Utaqarra. The site is approximately four kilometres from the Geraldton city centre.

Local Context

The land to the north and west of the northern portion of Lot 800 is zoned 'Residential', have approved Local Structure Plans and have been partially developed for residential purposes.

The land directly to the east is vacant land currently used for agricultural purposes. The southern boundary is the Southern Transport Corridor (Geraldton-Mount Magnet Road).

In respect to the southern portion of Lot 800 the northern boundary is the Southern Transport Corridor (Geraldton-Mount Magnet Road). The land to the east and south is currently zoned 'Rural' and is used for agricultural purposes. The land to the west is currently vacant and is zoned 'Development' and a Local Structure Plan is currently being prepared by the landowner (Department of Housing).

1.2.2 Area and Land Use

Lot 800 is approximately 141 hectares in area and Lot 23 is approximately 5 hectares in area. The site is currently vacant.

1.2.3 Legal description and ownership

The LSP area comprises Lots 23 and 800 Moloney Street, Utaqarra.

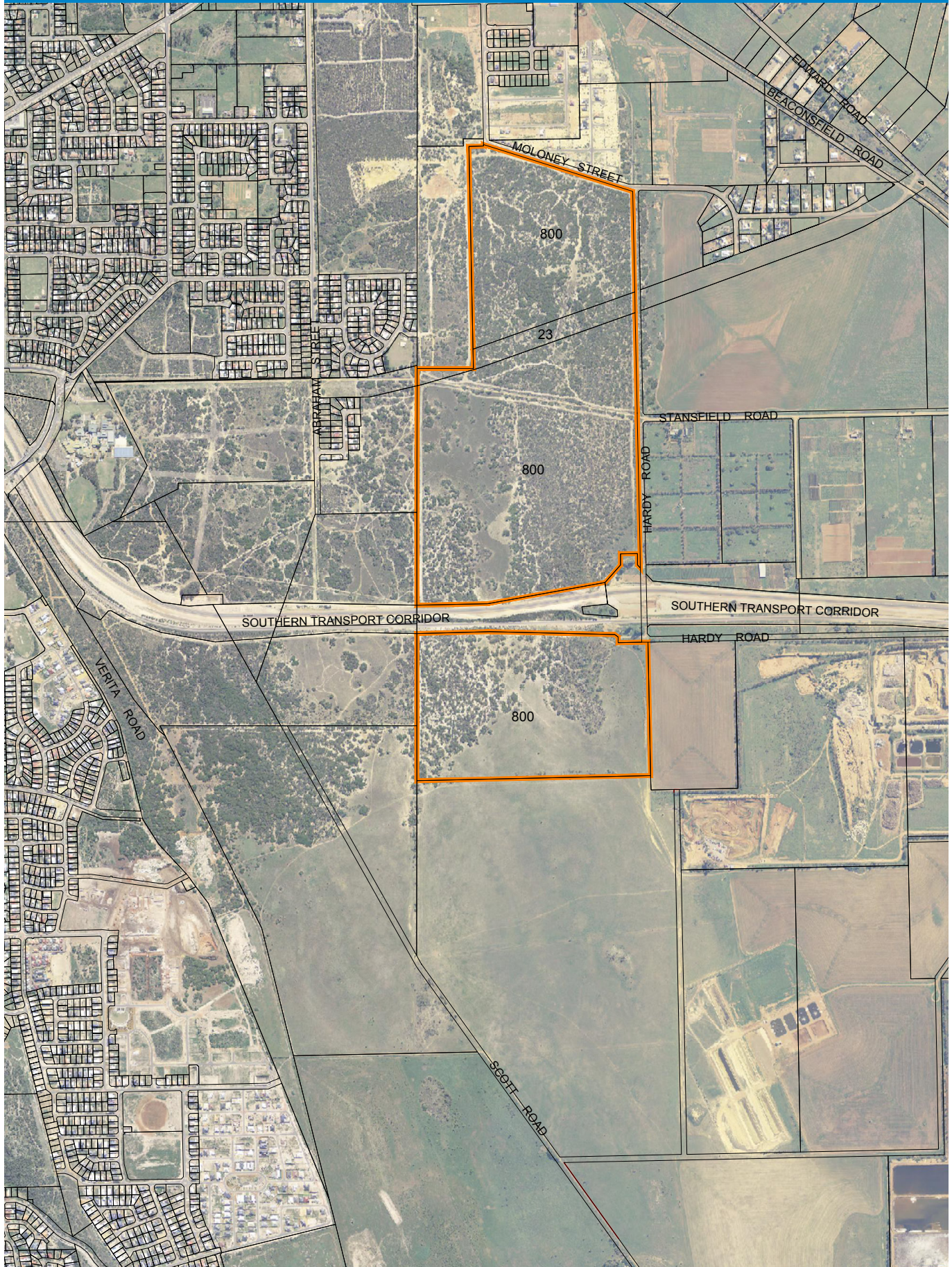
The legal description of the subject land is provided in Table 1.

TABLE 1 – LOT DETAILS

Lot Number	Certificate of Title	Owner
800	Volume 2546 Folio 972	Wandina Pty Ltd
23	Volume 1908 Folio 255	Commissioner of Main Roads

02 part two: explanatory section

FIGURE 2: SITE PLAN



02 part two: explanatory section

1.3 Planning Framework

1.3.1 Zoning and Reservations

City of Greater Geraldton Town Planning Scheme No. 5

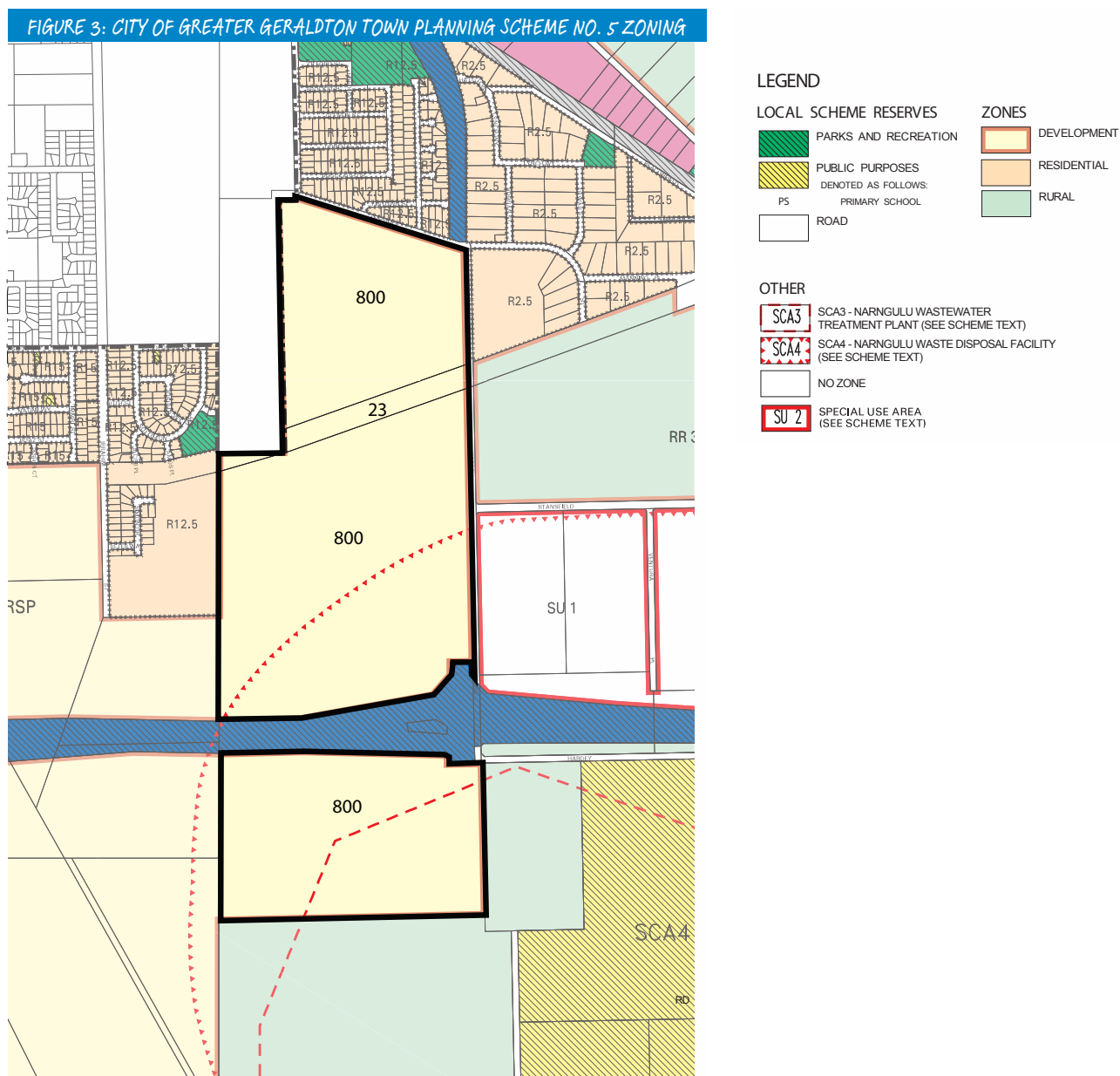
The subject site is zoned 'Development' in accordance with LPS5.

The Narngulu Wastewater Treatment Plant is identified in LPS5 as Special Control Area 3 (SCA 3) and the Narngulu Waste Disposal Site is identified as Special Control Area 4 (SCA 4).

The clause relating to SCA 4 states:

'Residential development or subdivision will not be approved or supported respectively within the Narngulu Waste Disposal Facility Special Control Area.'

The buffers for SCA 3 and SCA 4 both impact on the subject site as shown in Figure 4.



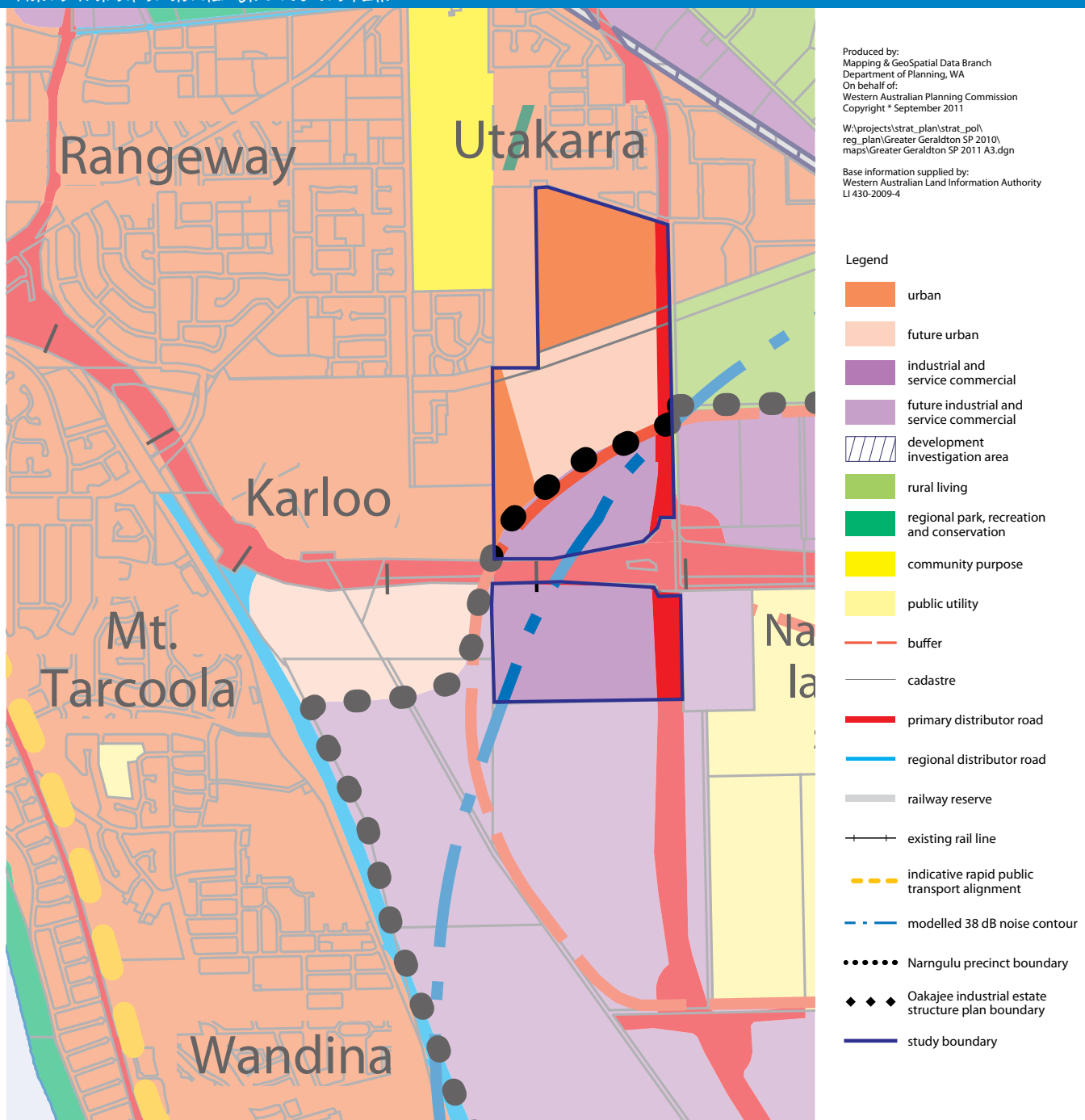
02 part two: explanatory section

1.3.2 Regional and Sub-Regional Structure Plans

Greater Geraldton Structure Plan (2011)

The Greater Geraldton Structure Plan 2011 (GGSP) is an update of the Greater Geraldton Structure Plan (1999). The GGSP primarily focuses on the urban areas and other areas likely to experience development pressures within the City of Greater Geraldton and the Shire of Chapman Valley. The Structure Plan provides a framework for coordinating development within this area and provides the basis for statutory planning and development control. The GGSP identifies the majority of the site for 'future industrial and service commercial' with the remainder identified as 'future urban' (refer to Figure 4). The area identified for 'future urban' is the portion of the subject site, which is located outside of the Narnunglu Industrial Estate Buffer.

FIGURE 4: GREATER GERALDTON STRUCTURE PLAN



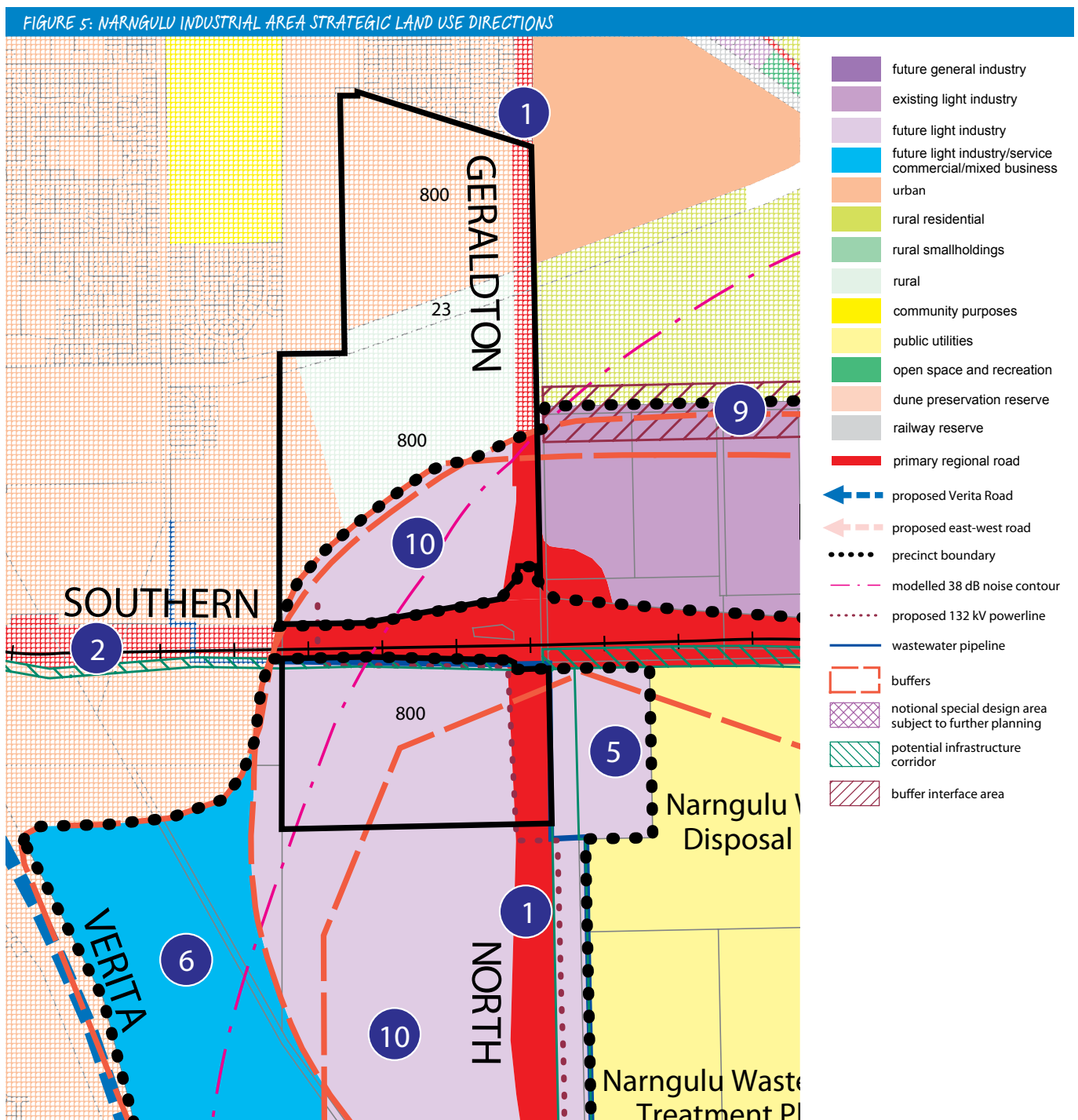
02 part two: explanatory section

Narngulu Industrial Area Strategic Land Use Directions (WAPC, 2010)

The NIASLUD reviews the current strategic planning framework for the Narngulu Industrial Area and provides direction for future planning and development. The subject site is located within 'Precinct A' of the NIASLUD, with the majority of the site identified as 'future light industry/service commercial/mixed business' and 'future light industry' for the portions of the site impacted by the Narngulu Wastewater Treatment Plant buffer and the Narngulu Waste Disposal Site buffer (refer to Figure 5). The northern portion of the site is not included in the NIASLUD.

The portion of the site identified for 'future light industry/service commercial/mixed business' is described as potentially consisting of large format bulky goods commercial uses. The NIASLUD states that the final size of this area and types of uses "will be subject to detailed local structure planning to ensure compatibility of uses".

In the eastern portion of the site, the land affected by the Narngulu Wastewater Treatment Plant buffer is identified for future light industry uses. The site is identified by the NIASLUD predominately for the aforementioned uses, and as such the concept plan for the site has identified service commercial and mixed business land uses.



1.3.3 Policies

State Policies

State Planning Strategy (December 1997)

The State Planning Strategy (1997) was prepared by the WAPC as a whole of Government approach to guide sustainable land use planning throughout the State up until 2029. The Strategy is aimed at developing a land use planning system to help the State achieve a number of key goals. These include generating wealth, conserving and enhancing the environment and building vibrant and safe communities for the enjoyment of this and subsequent generations of Western Australians. The Strategy was last audited in 2000-2001.

Liveable Neighbourhoods (2007)

Liveable Neighbourhoods has been prepared to implement the objectives of the State Planning Strategy. It is an operational policy, adopted by the WAPC, for the design and assessment of structure plans and subdivision for new urban areas and large brownfield or urban infill sites in the metropolitan area and country centres.

State Planning Policies

Development of land must generally be consistent with any relevant State Planning Policies (SPP) which are prepared and adopted by the WAPC under statutory procedures set out in Part 3 of the Planning and Development Act 2005. The WAPC and local governments must have due regard to the provisions of SPPs when preparing or amending regional and district planning schemes and when making decisions on planning matters. Details of the SPPs relevant to the site are provided below.

i) State Planning Policy No 1 - State Planning Framework Policy (2006)

The State Planning Framework Policy (SPP 1.1) provides a framework for the application of more detailed planning policies and strategies in Western Australia, including general principles derived from the State Planning Strategy. It states that the primary aim of planning is to provide for the 'fair, orderly, economic and sustainable use and development of land'.

ii) State Planning Policy 2 - Environmental and Natural Resources Policy (2003)

The policy sets out a planning response to environmental and natural resource management issues within the framework of the State Planning Strategy.

Specific policy areas of relevance to this LSP include those relating to water resource management, air quality, soil and land quality, biodiversity, landscapes and energy efficiency.

iii) State Planning Policy 2.9 - Water Resources (2006)

The purpose of this policy is to guide development of land that may impact on water resources in the state. Under the policy, water resources include 'water in the landscape with current or potential value to the community or environment'. This incorporates features such as wetlands and waterways, surface water, groundwater, drinking water catchments and sources, stormwater and wastewater. The policy aims to ensure that the quality and quantity of water resources in the state are not adversely affected by development and land use.

02 part two: explanatory section

iv) State Planning Policy No. 3 - Urban Growth and Settlement (2006)

This policy sets out the principles and considerations to apply to planning for urban growth settlement in Western Australia. The policy aims to facilitate sustainable patterns of urban growth and settlement.

The objectives of the policy are:

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

v) State Planning Policy No. 3.6 - Developer Contributions for Infrastructure (2009)

SPP No. 3.6 sets out the principles and considerations that apply to development contributions for the provision of infrastructure in urban areas. The policy brings together Planning Bulletin 18 - Developer Contributions for Infrastructure and Planning Bulletin 41 - Draft Model Text Provisions for Development Contributions.

The policy sets out the form, content and process for the preparation of a development contribution plans.

vi) State Planning Policy No. 4.1 – State Industrial Buffer (2004)

The purpose of the policy is to provide a consistent statewide approach for the protection and long-term security of industrial zones, transport terminals (including ports) other utilities and special uses. It will also provide for the safety and amenity of surrounding land uses while having regard to the rights of landowners who may be affected by residual emissions and risk.

The policy establishes objectives and principles and how the principles should be applied to define and secure buffer areas and who should pay for them. It is intended that the WAPC will, after the policy has been in operation for a period of two full years, undertake a review of its effectiveness, and if necessary amend the policy.

The objectives of this policy are:

- To provide a consistent statewide approach for the definition and securing of buffer areas around industry, infrastructure and some special uses.
- To protect industry, infrastructure and special uses from the encroachment of incompatible land uses.
- To provide for the safety and amenity of land uses surrounding industry, infrastructure and special uses.
- To recognise the interests of existing landowners within buffer areas who may be affected by residual emissions and risks, as well as the interests, needs and economic benefits of existing industry and infrastructure which may be affected by encroaching incompatible land uses.

The Structure Plan area is affected by the Narngulu Industrial Area Buffer. The proposed land uses are in accordance with this buffer.

viii) **State Planning Policy No. 5.4 - Road and Rail Transport Noise and Freight Considerations in Land Use Planning (2009)**

SPP No. 5.4 is aimed at increasing awareness of transport noise and its potential impact on the amenity and quality of life for residents. The policy therefore has objectives and implementation strategies to ensure that land use and transport planning are compatible. The policy also establishes a standardised set of criteria to be used in the assessment of proposals affected by transport noise.

The residential portion of the LSP is located adjacent to the proposed Geraldton North-South Highway. As the design and timing of construction, if ever, of this road is unknown a noise assessment has not been undertaken.

City Of Greater Geraldton Strategies And Policies

i) **Local Planning Policy – Towards Sustainable Residential Development**

This policy enables sustainability principles to be applied in the City's assessment of residential developments. The Policy has the following objectives:

- To assist achieving more sustainable residential developments by making concessions in particular cases on any design element of the Residential Design Codes (with the exception of housing density and building height requirements).
- To encourage the development of more sustainable, environmentally sensitive and contemporary residential buildings of a high design quality.
- To encourage developments, more sustainable than those of the previous era, in recognition of growing commercial benefits, community demand, increased individual and community vulnerability to climate changes and energy price increases and City policy on environmental and social responsibility.
- To permit and encourage diverse and innovative housing forms that demonstrates sustainability outcomes so as to promote a wider choice in housing and satisfy the demand of a variety of household types and lifestyles.

The policy applies to developments, but the design of the subdivision as guided by local structure plans is relevant to determining how easily buildings can meet the objectives of the policy. In particular, policy provisions relating to building orientation, energy efficiency and water usage have a strong relationship to lot orientation and water management systems in place within the estate.

The LSP and the Local Water Management Strategy (Appendix A) seek to maximise the opportunities for future residential development to realise sustainability objectives as outlined in this policy.

02 part two: explanatory section

ii) Geraldton Regional Flora and Vegetation Survey Review (GRFVS)

The following plant communities were identified in the GRFVS as occurring within the site (WAPC, 2010a):

1. 10 Near Coastal: *Acacia rostellifera* shrubland (ncAr)
2. 13 Sandplain: *Banksia prionotes* / *Acacia rostellifera* (Bp/Ar)

Plant community 10 is usually dominated by *Acacia rostellifera*. *Acacia xanthina*, *Alyxia buxifolia* or *Chamelaucium uncinatum* may be dominant or co-dominant species in this plant community. Plant community 10 occurs on taller secondary dunes, and on exposed limestone and sandplain soils to the east as a result of disturbance to other plant communities. On the sandplain soils, the plant community may have formerly included *Banksia prionotes* but has since been reduced to a simpler community dominated by *Acacia rostellifera* (WAPC, 2010a).

Plant community 13 is dominated by *Banksia prionotes* and *Acacia rostellifera*, and occurs on sandplain soils inland from the coast. Characteristic species are *Grevillea candelabroides*, *Melaleuca depressa*, *Hibbertia spp.*, *Conostylis spp.* and sedges and rushes (WAPC, 2010a).

Plant community 10 occupies 2,258.86 ha or 36.63% of the native vegetation of the GRFVS area, and is the most widespread of the GRFVS plant communities. Plant community 13 occupies 754.39 ha or 12.23% of the native vegetation of the GRFVS area, and is also one of the more widespread GRFVS plant communities (WAPC, 2010a).

There are no DPaW listed or Commonwealth listed (Environment Protection and Biodiversity Conservation Act 1999) threatened ecological communities in the GRFVS area (WAPC, 2010a).

iii) Geraldton Local Biodiversity Strategy

The Geraldton Local Biodiversity Strategy (LBS) was adopted by Council in October 2013. The overall goals of the strategy are to:

- Retention - Retain natural areas. Aim to retain at least 3,334ha of the remaining 6,041ha of natural areas remaining.
- Protection - Protect natural areas and specific biodiversity features, targeting at least 5% of the original extent of natural areas, leading to the protection of an additional 1,058ha of areas of conservation value.
- Management - Manage protected natural areas for conservation. Active management of 100% of LGA natural areas of conservation value.
- Engagement – Increased community contributions to biodiversity conservation. Decrease in behaviours identified as threats to biodiversity values.
- Regeneration - Ensure the rate of regeneration exceeds the rate of degradation. E.g. restore more than 1,500 ha of natural areas in CGG.

2.0 SITE CONDITIONS AND ENVIRONMENT

2.1 Biodiversity and Natural Area Assets

2.1.1 Flora

Onsite Vegetation Units and Condition

A Level 2 flora and vegetation survey was undertaken across the site in spring 2012 in accordance with the EPA's Guidance Statement No. 51 – *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004) for a Level 2 survey.

The vegetation within Lots 800 and 23 comprised mainly a Thicket of *Acacia rostellifera* in the sandy soils, which varied in vegetation condition from Very Good to Degraded and Completely Degraded where the vegetation had been cleared and replaced by weeds.

The other units recorded were:

- Very Open Shrub Mallees of Eucalyptus species over Scrub of *Melaleuca cardiophylla* on limestone ridge. This was vegetation unit 11 described in GRFVS. The vegetation condition of this area was rated as Very Good.
- Dense Thicket to Thicket of *Melaleuca cardiophylla*, *Diplolaena grandiflora* and *Grevillea argyrophylla* below the ridge but with limestone outcropping. This was vegetation unit 12 described in GRFVS. The vegetation condition of this unit was rated as Very Good and Good.
- Open Scrub to Scrub of *Acacia rostellifera* over *Melaleuca campanae* and *Melaleuca depressa* and a variety of other shrub taxa in sandy soil with occasional outcropping limestone (This appears to be different to vegetation unit 12 described in GRFVS, but appears to be similar to vegetation unit 14). The vegetation condition of this unit was rated as Very Good to Good.
- Low Woodland A of *Banksia prionotes* over Thicket of *Grevillea candelabroides* and *Acacia scirpifolia* in yellow sand. This was vegetation unit 13 described in GRFVS. The vegetation condition of this unit varied between Good to Degraded due to high cover of weed taxa.

Many weeds were recorded from the survey lots including: *Lycium ferocissimum*, a thorny shrub was common in disturbed areas; *Euphorbia terracina* (Geraldton Carnation Weed); *Bromus diandrus* (Great Brome), *Ehrharta calycina* (Perennial Veldt grass), *Reichardia tingitana* (False Sowthistle) and *Echium plantagineum* (Paterson's Curse).

There were many tracks throughout the remnant bushland that were Completely Degraded but were too small in area to accurately map. In addition rubbish had been dumped including cars bodies, which had been stripped and burnt. Dumping appears to be continuing at present particularly as the site is in proximity to new housing developments. Tracks were utilised by 4x4 as well as BMX type bikes and motorbikes.

A PATN analysis (Belbin and Colleis, 2006) was run using Bray Curtis method for the percentage cover of taxa in each quadrat to determine the communities present. No Threatened Ecological Communities or Priority Ecological Communities were recorded.

Refer to Figures 7 and 8 for the Vegetation Units and Vegetation Condition.

Declared Rare and Priority Flora

A number of *Leucopogon marginatus* plants were found within Lot 800 subsequent to the flora survey. The species is listed as Declared Rare Flora (Threatened Flora) under the Wildlife Conservation Act 1950.

The definition of Declared Rare Flora is species that have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.

This species is described as an erect spreading shrub, 0.4-1 m high with white flowers. The flowering period is July to August. The habitat for this species is identified as yellow & gravelly lateritic sand and undulating plains (DPaW, 2014). The following priority species were identified during the spring survey:

1. *Beyeria cinerea subsp. cinerea* (Priority 3), and
2. *Vittadinia cervicalaris var. occidentalis* (Priority 1)

02 part two: explanatory section

FIGURE 7: VEGETATION UNITS

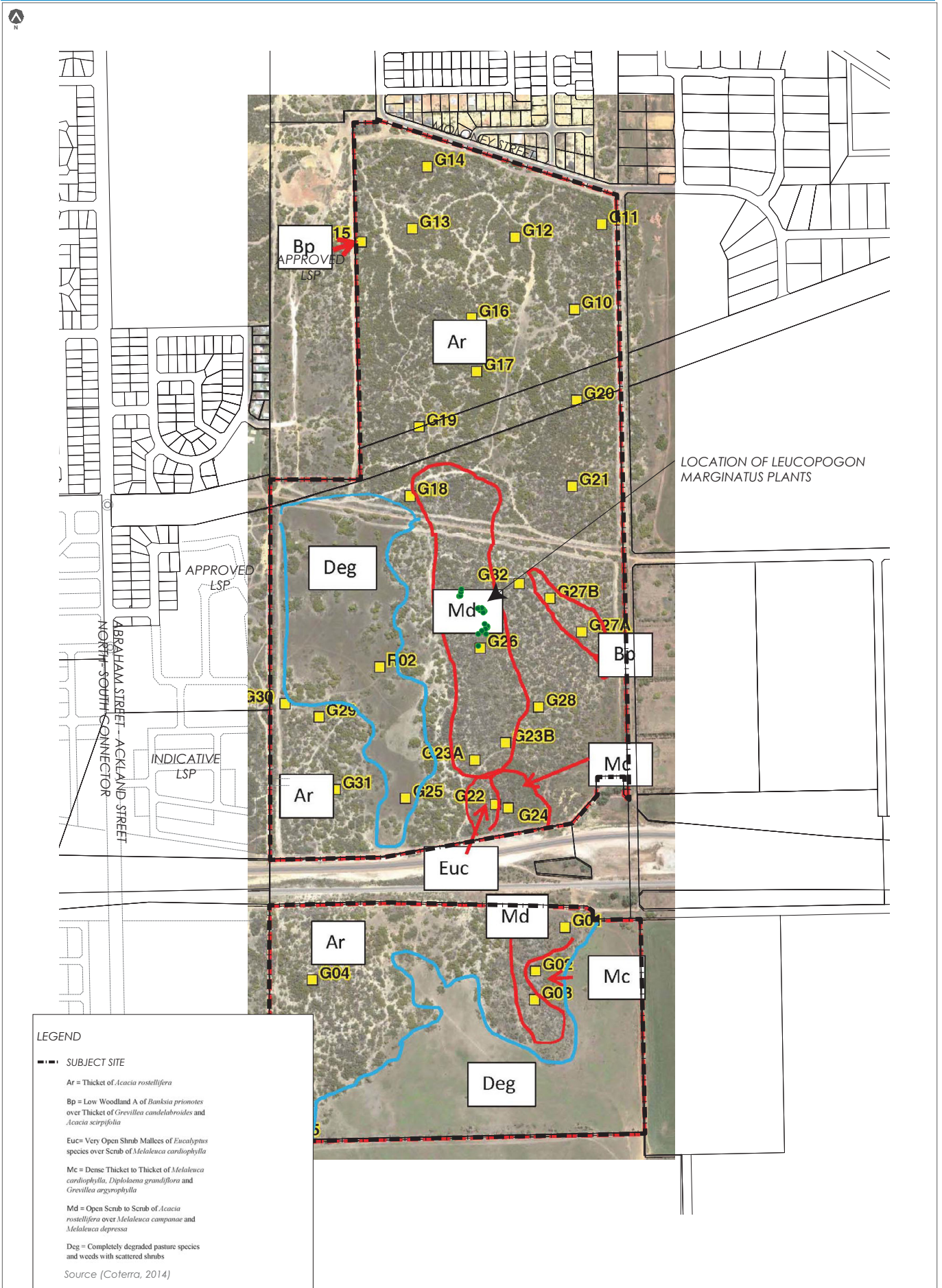
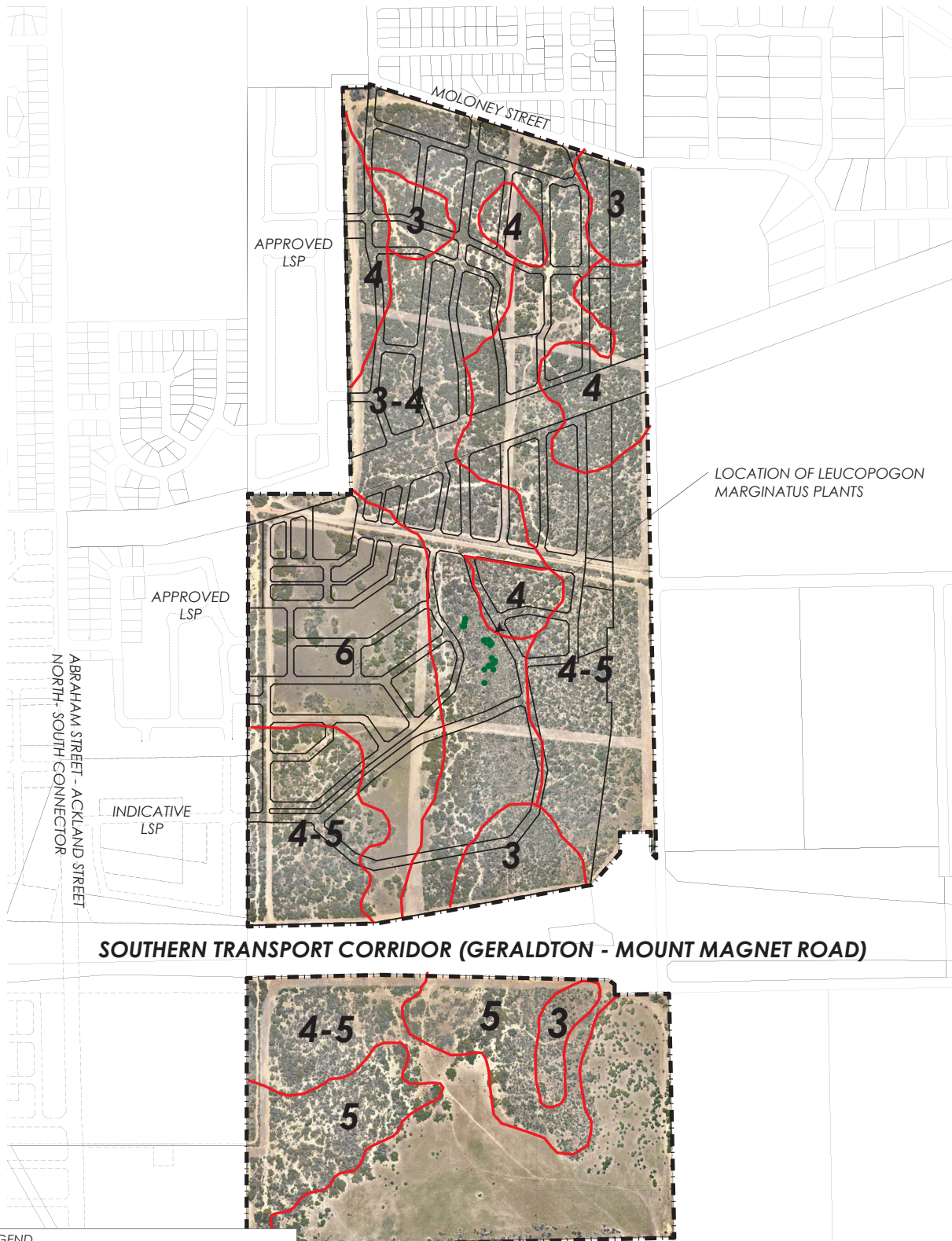


FIGURE 8: VEGETATION CONDITION



LEGEND

- SUBJECT SITE
- VEGETATION CONDITION BOUNDARY

RATING	DESCRIPTION
3	very good
3-4	varying between very good and good
4	good
4-5	varying between good and degraded
5	degraded
6	completely degraded

Source (Coferra, 2014)

Beyeria cinerea subsp. *cinerea* (P3) was found north of the Southern Transport Corridor, within Lot 800. This species is not listed for this region in the DPaW NatureMap database, but it is recorded both north and south of the survey area. It is described in the DPaW Florabase database as a prostrate, erect or spreading shrub, 0.15-0.5(-1) m high with green/yellow flowers from May to October. It is found in grey/white or red sand on coastal limestone and dunes (DPaW, 2014).

A Priority 3 species is defined as a species that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat (DEC, 2013). Species may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them (DEC, 2013).

A Priority 1 flora species was also tentatively identified within Lot 800. *Vittadinia cervicularis* var. *occidentalis* was possibly present immediately south of the Southern Transit Corridor. This species is described as an annual herb, more than 0.3 m high, which has white-purple-blue flowers from August to September (DPaW, 2014).

Priority 1 flora are defined as species that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, rail reserves and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes (DEC, 2013).

2.1.2 Fauna & Habitat

A search of the State and Federal databases identified a number of conservation significant fauna species as potentially occurring in this general area. Based on a review of the habitat characteristics required by these species, and the conditions present onsite the following species were identified as possibly occurring:

- Carnaby's Black Cockatoo
- Rainbow Bee-eater
- Carpet Python

The full list of the potential conservation significant species and their habitat requirements is provided in the Environmental Assessment (Appendix C).

The vegetation types present onsite may provide some habitat opportunities for these species, however, it is noted that much of the site has been impacted by degrading processes including access track creation and weed invasion. This could potentially affect the habitat viability of the site, particularly for transient bird species such as the Carnaby's Black Cockatoo.

Based on the vegetation species present onsite, foraging opportunities for Carnaby's are possible, however the predominant vegetation species associated with the vegetation communities across the site (i.e. *Acacia rostellifera*) is not recognised as a foraging / roosting habitat plant for Carnaby's Black Cockatoo.

The Rainbow Bee-eater is a relatively common migratory species, and land development is not considered a threat to this species. Geraldton is located at the northern end of Carpet Python's range. This species could possibly occur in the area. The species habitat is described by the DEC as semi-arid coastal and inland habitats consisting of Banksia woodland, Eucalypt woodlands, and grasslands. The *Acacia rostellifera* plants which are the dominant species present onsite do not meet this habitat description. As such the site appears unlikely to be an important habitat area for this species.

02 part two: explanatory section

2.2 Landform and Soils

Soils onsite are part of the Tamala South Soil Landscape System, with a small portion of the eastern side of Lot 800 comprising the Greenough Alluvium System, as mapped by the Department of Agriculture. The extent of each system is shown on Figure 4.

These systems are described by the Department of Agriculture as follows:

- Tamala South - Rises and low hills with relict dunes and some limestone outcrop on coastal limestone north of Jurien Bay. Yellow deep sands common, with yellow/brown shallow sands and calcareous shallow and deep sands. Banksia woodlands and heathlands.
- Greenough Alluvium - Level alluvial plain with areas of minor terracing. Red sandy and loamy earths, hard cracking and self-mulching clays. Acacia rostellifera shrubland and river red gum woodland.

The sub-systems present onsite are:

- Tamala South 4 (221Ta_4Ty) yellow deep sand phase soil subsystem: gently undulating plain on the eastern side of the Tamala Limestone. Slopes 2-8%. Yellow deep sand. Geology: lithified Pleistocene calcareous dune deposits.
- Greenough 4 Bootenal (221Ga_4Bwd) well drained phase soil subsystem: level to very gently undulating prior alluvial depositional plain (1-3% slope). Red sandy and loamy duplex soils with brown deep sands. Geology: alluvium.

The Department of Environment Regulation (DER) Acid Sulfate Soils (ASS) risk mapping, indicates that the site is mapped as having a low to no risk of encountering ASS within 3 m of natural surface level. Further, CSIRO mapping indicates that this general area has an extremely low probability of Acid Sulfate Soil occurrence.

Geotechnical investigations have been undertaken for the LSP area. Please refer to the Geotechnical Report in Appendix E.

2.3 Hydrology

2.3.1 Surface Water

There are no surface water features within the site.

3.5.2 Groundwater

Groundwater level information is not readily available for this location. Information available from Department of Water (DoW) in relation to the nearby Greenough shallows bore (located approximately 1.5km from the site) indicates that the groundwater level in this general area is approximately 3m AHD.

In relation to the adjacent Department of Housing development site (located to the immediate west of Lot 800), DoW has advised that there is sufficient separation depth to groundwater such that pre- and post-development monitoring of water quality is not necessary. It is envisaged that this situation will be the same for Lot 800.

The site is situated within the proclaimed Arrowsmith Groundwater Area, which covers the northern-most extent of the Northern Perth Basin, from Geraldton to Green Head and east to Coorow, in the state's Mid West region. A groundwater allocation plan has been prepared by the Department of Water, which details the objectives of the proclaimed Arrowsmith Groundwater Area and broad management requirements. These include:

- A guideline for the allocation and licencing of groundwater in the Arrowsmith Groundwater Area.
- Details on the effects of abstraction on groundwater quality and groundwater-dependent ecosystems.

This plan will guide the assessment of groundwater licence applications in respect to allocations entitlements in the Arrowsmith Groundwater Area.

02 part two: explanatory section

FIGURE 9: GEOLOGY PLAN

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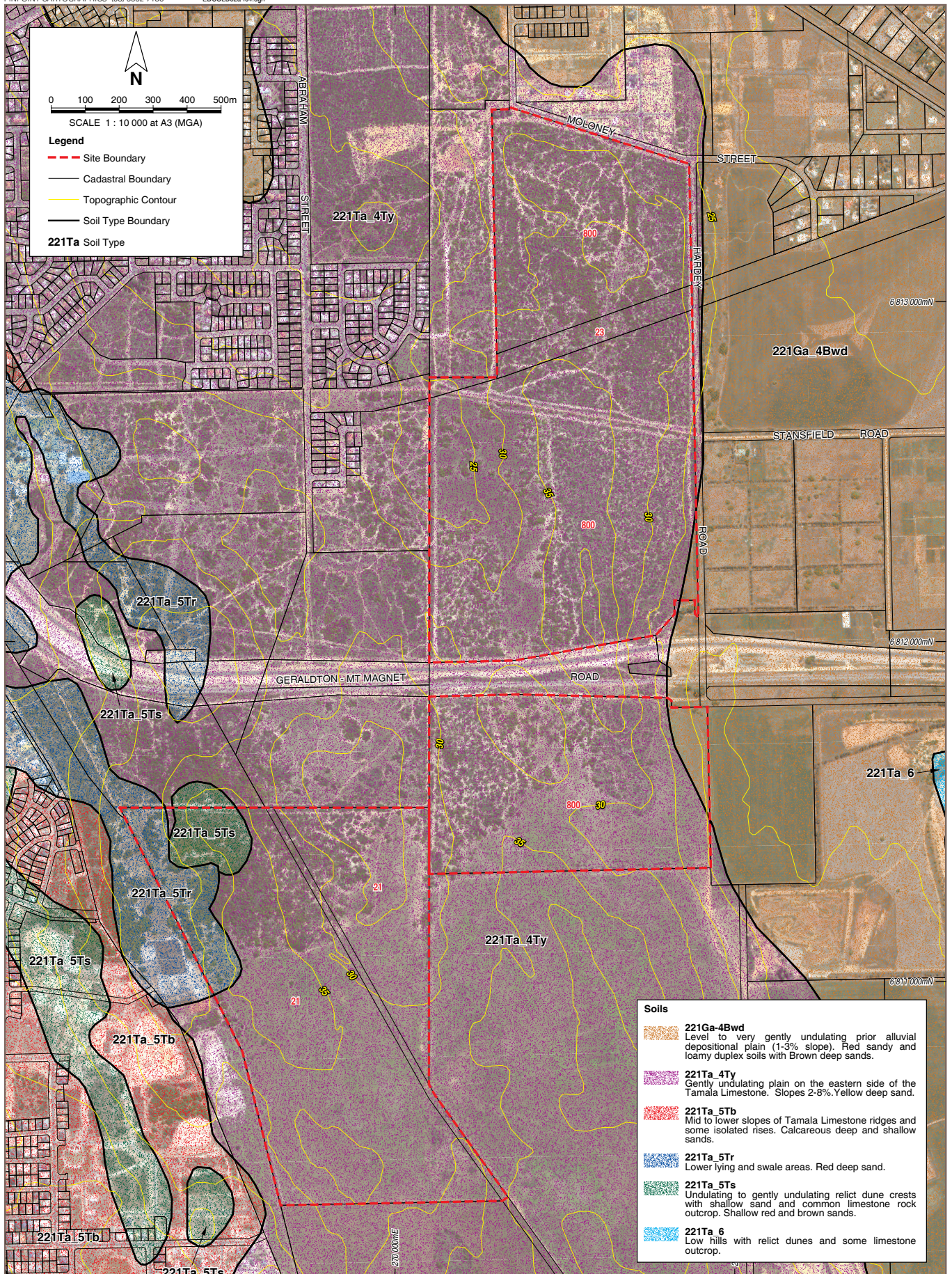
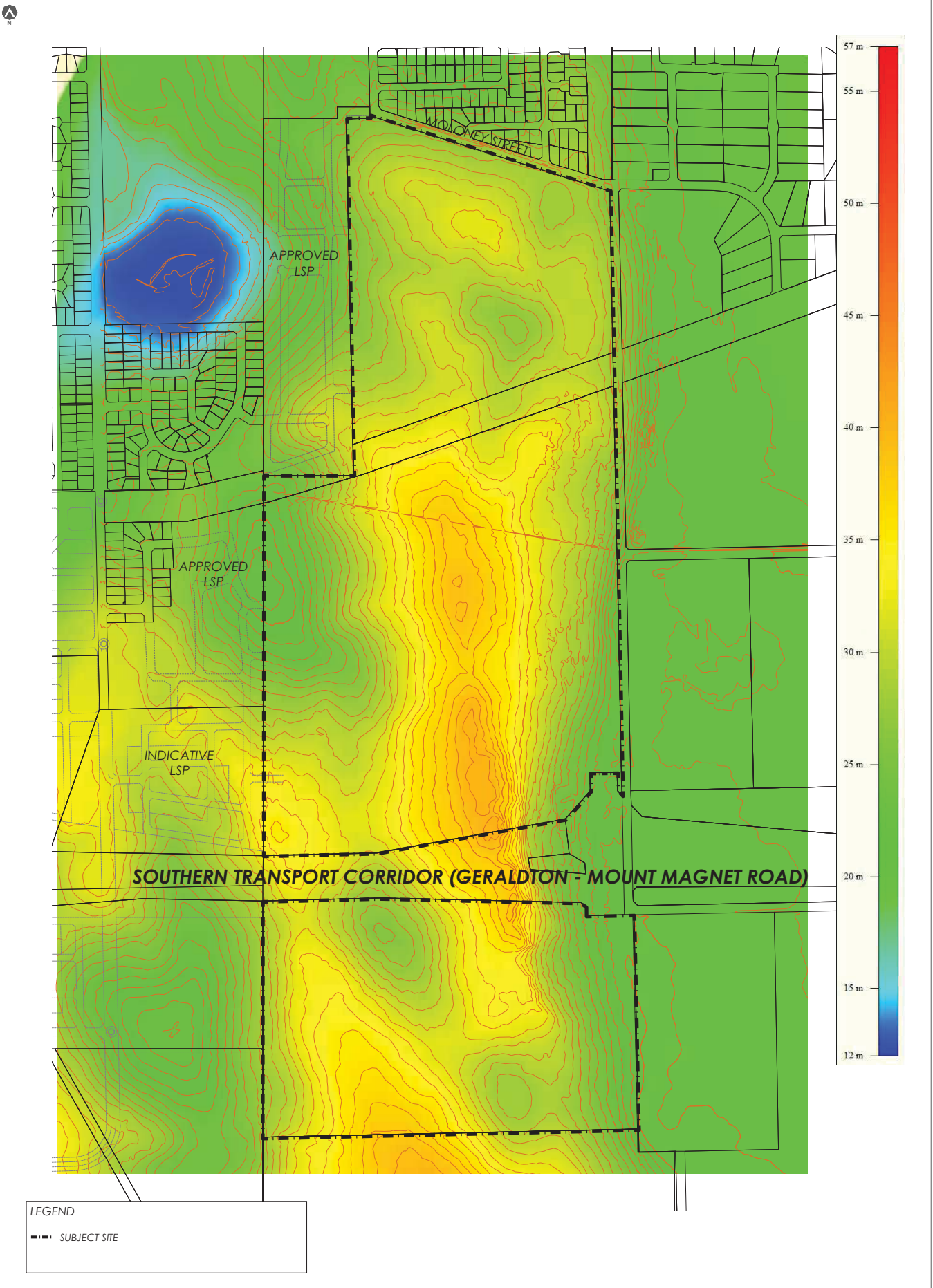


FIGURE 10: CONTOUR TINT



02 part two: explanatory section

2.4 Bushfire hazard

A Bushfire Hazard and BAL Assessment was prepared for the subject site by Strategen (refer to Appendix F). Key objectives of the assessment were:

1. Undertake a detailed Bushfire Hazard Assessment of the project area and surrounds.
2. Undertake a BAL assessment of the project area in accordance with AS 3959–2009.
3. Document key findings of the Bushfire Hazard and BAL assessments, including mapping of bushfire hazard areas and hazard levels in accordance with methodology outlined in the Guidelines.
4. Verify compliance of the proposed development with Guideline performance criteria in light of the assessed bushfire hazard levels and BAL.
5. Provide bushfire fuel hazard assessment for the future Fire Management Plan or any additional fire mitigation works to address current bushfire issues at the project area.

2.5 Heritage

Aboriginal Heritage

A search of the Department of Aboriginal Affairs (DAA) Aboriginal heritage sites database did not identify any registered sites within the landholdings (DAA, 2012). Three 'Other Heritage Places' are identified in the vicinity of the site as follows:

- Utakarra Pinnacles (Stored Data)
- Geraldton Southern Transport Corridor Field Site 02 (Stored Data)
- Gstcs2-Artifact Scatter As001/2009

Prospective purchasers should refer to the Cultural Heritage Due Diligence Guidelines so that are informed of their obligations with regards to Aboriginal heritage.

European Heritage

A search conducted under the Heritage Council of WA database revealed no heritage sites located within the site.

2.6 Context and Constraints Analysis

Future Transport Routes

The proposed Geraldton North-South Highway reserve is located within the site on its eastern boundary. This reserve was defined by Main Roads WA in their Route Definition Planning Study for the Geraldton North South Highway (May 2010). The City resolved to initiate an amendment to Town Planning Scheme No. 5 in December 2010 to reserve the land requirements for the Highway subject to a number of conditions. These conditions are yet to be met and the rezoning has not progressed.

Noise

The LSP area is affected by the following existing and proposed noise sources:

- Narngulu Industrial Area 38dB Noise Emission Contour; and
- Future Geraldton North-South Highway on the sites eastern boundary.

An Environmental Noise Assessment has been undertaken by Herring Storer on behalf of the City. This assessment concluded:

'While the suggestion of the 38 dB(A) contour buffer line was, in our opinion, reasonable at the time of its development in 2002 when the Narngulu Industrial Estate was expected to accommodate heavy industry, it has no basis under the current legislation and is no longer relevant should the Narngulu Industrial Estate be developed as a transport hub. As such, it is strongly suggested that the 38 dB(A) contour buffer line no longer be used by the relevant authorities in land use planning and that the Narngulu Industrial Buffer, which is better aligned with EPA policy, be used instead.'

In respect to the future Geraldton North-South Highway on the sites eastern boundary. As the design and timing of construction, if ever, of this road is unknown a noise assessment has not been undertaken.

Buffers

Lot 23 and 800 is impacted by the following three buffers:

Narngulu Wastewater Treatment Plant Buffer

The Narngulu wastewater treatment plant buffer is reflected as a special control area in LPS No 5. The schemes' provisions prohibit residential land uses and other sensitive land uses in the wastewater treatment plant buffer.

Narngulu Waste Disposal Site Buffer

The Narngulu waste disposal site buffer is reflected as a special control area in LPS No 5. The schemes' provisions prohibit residential land uses and other sensitive land uses in the waste disposal site buffer.

Narngulu Industrial Estate Buffer

This buffer was proposed in the Narngulu Industrial Estate Study, prepared for the Geraldton Region Plan Review Technical Committee. It was subsequently adopted into the Geraldton Region Plan and Greater Geraldton Structure Plan. This buffer is not shown on LPS No. 5.

Adjacent Local Structure Plans

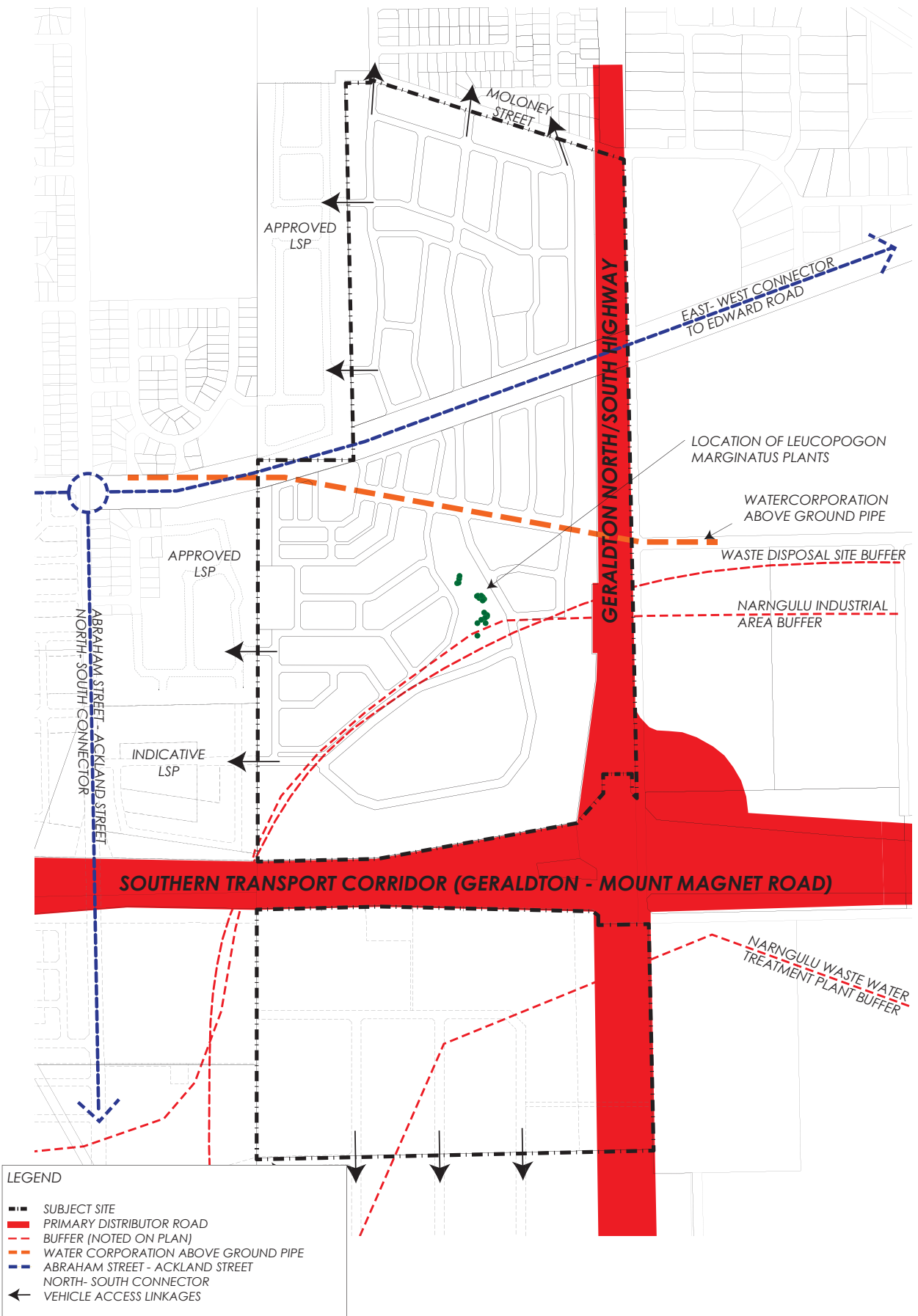
The land to the north and west of the northern portion of Lot 800 is zoned 'Residential', have approved Local Structure Plans and have been partially developed for residential purposes.

The land directly to the east is vacant land currently used for agricultural purposes. The southern boundary is the Southern Transport Corridor (Geraldton-Mount Magnet Road).

In respect to the southern portion of Lot 800 the northern boundary is the Southern Transport Corridor (Geraldton-Mount Magnet Road). The land to the east and south is currently zoned 'Rural' and is used for agricultural purposes. The land to the west is currently vacant and is zoned 'Development' and a Local Structure Plan is currently being prepared by the landowner (Department of Housing).

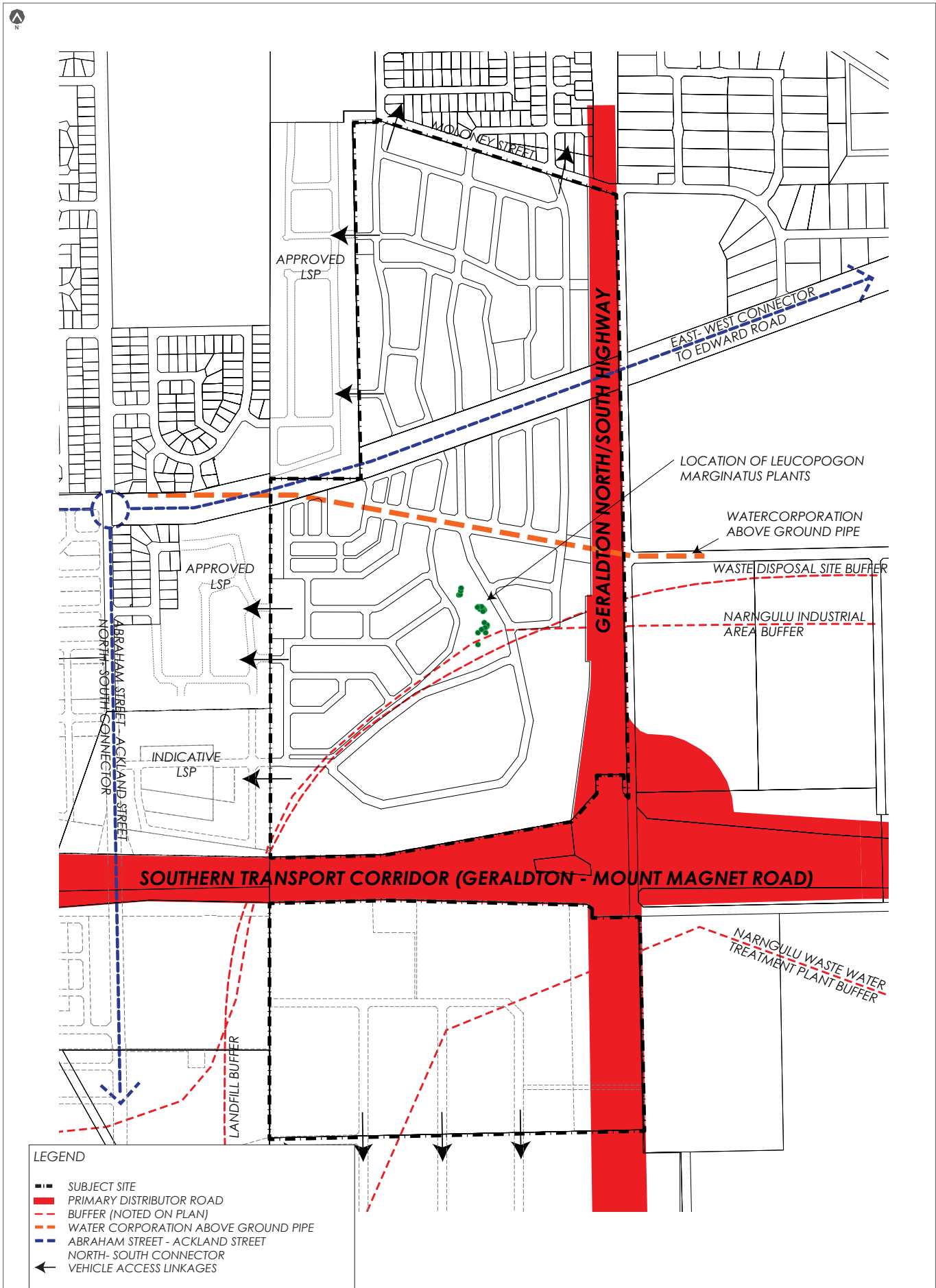
02 part two: explanatory section

FIGURE 11: CONTEXT + CONSTRAINTS PLAN



02 part two: explanatory section

FIGURE 12: CONTEXT + CONSTRAINTS PLAN WITH CONCEPT PLAN



02 part two: explanatory section

3.0 LOCAL STRUCTURE PLAN

3.1 Land Use

3.1.1 Masterplan

An indicative masterplan for the site has been prepared to demonstrate that the LSP design will create a legible, connected and functional development for both the residential and service commercial/light industrial areas. The mixture of open spaces, including a conservation reserve and neighbourhood and local parks within the residential area, will provide amenity and recreational opportunities for the areas residents, surrounding residents and visitors to the area.

The residential area will have an integrated access network (walking and cycling paths, road networks) that will facilitate movement and connectivity through all parts of the development and to the adjoining land. The residents will be serviced by nine local and neighbourhood parks, which are all within comfortable walking distance. The retention of vegetation in the public open space areas will be given a priority, including the provision of a 2.5 hectare conservation reserve to protect the Declared Rare Flora *Leucopogon marginatus*. Some of the public open space areas will also serve a drainage function.

The road network has been designed to provide for a legibility and permeability through the site. The proposed local roads and neighbourhood connectors link with roads identified on existing and proposal local structure plans to ensure integration with the neighbouring land.

The design allows for the provision of a mix of lot sizes and dwelling types to cater for a variety of demographics, ranging from first homebuyers, to families to retirees. This mix of demographics will result in a diverse community. The larger lots on the eastern periphery of the residential area will act as a buffer to the proposed Geraldton North-South Highway and provides the opportunity for purchasers who want area for a large shed and storage area (e.g. boat and caravans).

The location of the light industrial area accords with the Narngulu Industrial Area Strategic Land Use Directions report. A linear public open space area and roads will provide a separation between the proposed residential and light industrial areas. This will reduce the potential for land use conflict. The light industrial land on the southern side of the Geraldton-Mount Magnet Road has been designed to integrate with the land to the south and east.

3.2 Residential

3.2.1 Densities

The LSP proposes a range of Residential Design Code densities from R10 to R30.

3.2.2 Residential Yields and Lot Types

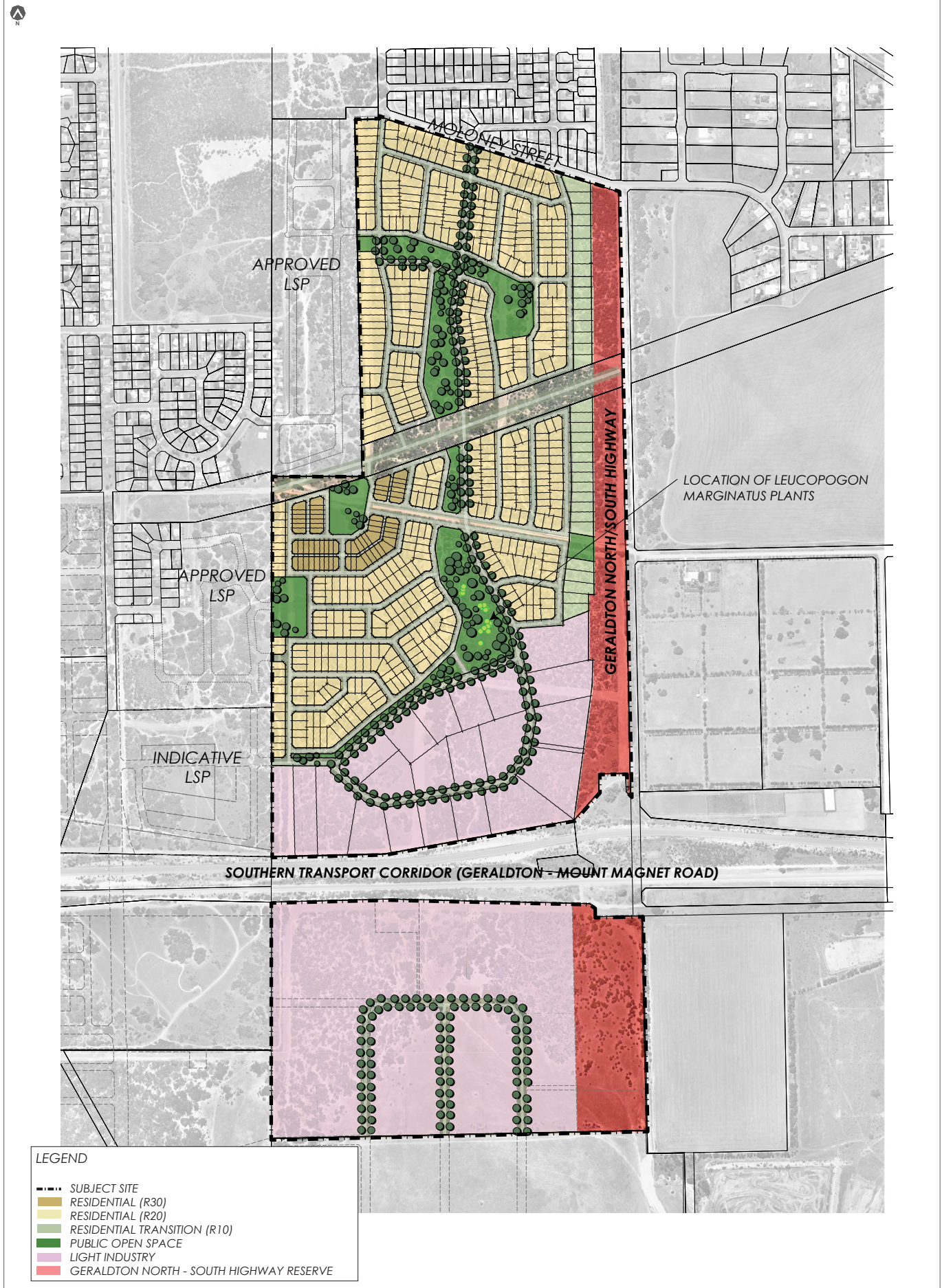
The dwelling yield target for the LSP, as detailed in Part 1, is 620 dwellings.

TABLE 2 : DWELLING + TYPE TABLE

Lot Area	Indicative Dwelling Yield	Percentage of Dwelling Type
R30	83	13%
R20	511	83%
R10	26	4%
Total	620	100%

02 part two: explanatory section

FIGURE 13: MASTERPLAN



02 part two: explanatory section

3.3 Light Industry

The masterplan proposes 45 light industrial lots ranging in area from 5000m² to 3.6ha. The final areas of the lots will be determined at the subdivision stage and will dependant on current market demand and the types of proposes uses.

The land use permissibility's in this zone are detailed in Part 1.

TABLE 3: LAND USE TABLE

Item	Data	Section number referenced within the structure plan report
Total area covered by the structure plan	145.8ha	Section 1.2.2
Area of each land use proposed:		Section 1.2.2
Residential	39.75ha	
Light Industry	51.38ha	
Public Open Space	10.21ha	
Estimated lot yield		
Residential	620	Section 3.0
Light Industry	44	
Estimated number of dwellings	620	Section 3.0
Estimated residential site density	15.8du/ha	Section 3.0
Estimated population	1426 ¹	Section 3.0
Number of high schools	0	Section 3.0
Number of primary schools	0	Section 3.6
Estimated retail floor space	0	Section 3.6
Estimated number and % of public open space:	9 parks 10.21ha	Section 3.5
Estimated area and number:		Section 3.4
Neighbourhood and Local Parks	8.81ha	
Estimated number and area of natural area and biodiversity assets	2.4ha	Section 3.4

¹ Based on 2.3 residents per dwelling

02 part two: explanatory section

3.4 Open Space

3.4.1 Public Open Space

The public open space (POS) for the LSP has been designed to meet the objective of ensuring new POS areas provide a balance between:

- A diversity of recreational uses and options for the community;
- The predicted active recreational needs of the community;
- Conservation of natural assets;
- High levels of amenity; and
- Environmental sustainability.

In light of the above, the POS areas proposed for the site can be categorised into three types:

- North-South Green Link;
- Conservation; and
- Neighbourhood and Local Parks.

The following details the purpose and function of each POS category.



EXAMPLE OF VEGETATION BEING RETAINED IN PUBLIC OPEN SPACE

North-South Green Link

The purpose of this POS is to provide for an ecological link through the site. This link includes a 2.4 hectare area of POS, which has been located to protect and preserve the Declared Rare Flora *Leucopogon marginatus*. It is proposed to retain as much vegetation as possible within this link, whilst providing for activity nodes (e.g. playgrounds and turf areas) on the edges to service the local residents. This link intersects with an east-west linear POS, which is a valley within the site and will provide a usable open space and drainage function.

Conservation

It is proposed to provide one conservation reserve within the site, totaling an area of approximately 2.4 hectares. The purpose of the conservation reserve is to protect and preserve the Declared Rare Flora *Leucopogon marginatus*. The proponent will liaise with the City and environmental Government agencies to determine the most appropriate treatment to protect this vegetation.

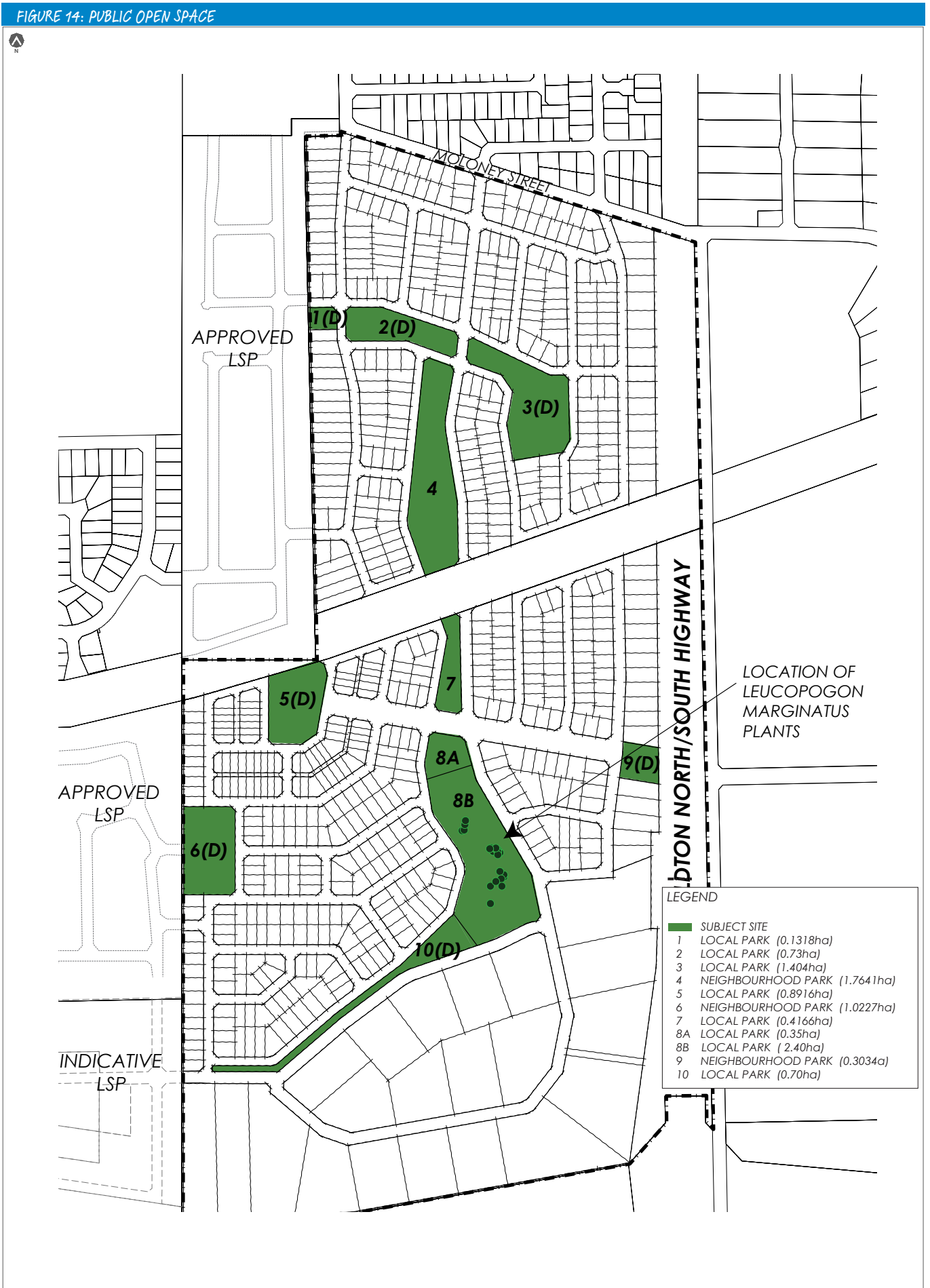
Neighbourhood and Local Parks

Neighbourhood and Local Parks provide nearby residences with high amenity open spaces, primarily for passive activities, but some will include kick-around areas for active recreation. It is proposed to provide a variety POS types and encourage exploration and development of the 'sense of place' within each space.

The parks will have manipulated topographies, which reflect but do not necessarily conserve the existing site grades. The neighbourhood parks vary in size and will be well defined by tree planting and public streets or pathways. They will contain a number of facilities and areas that allow people in the community to gather and meet; including elements such as barbecues, picnic tables, off-leash dog areas etc.

Some of the parks are located at low points, to assist with stormwater detention and drainage, however these parks also include planting, pathways, lighting and seating to ensure they contribute to the community as well as the environment.

FIGURE 14: PUBLIC OPEN SPACE



02 part two: explanatory section

3.4.2 Retention of Vegetation

A Structure Plan for Lots 23 and 800 has been prepared and is attached as Figure 4. This plan includes areas of vegetation proposed for retention within POS inside the residential and industrial portions of the development. The POS which is proposed to retain vegetation is located predominantly within the north-south linear corridor. The estimated area of retained vegetation is approximately 2.4ha. The breakdown of this vegetation into condition classes is provided below:

- Very Good – Good: 2.2ha
- Good: 0.2ha

Within the residential and the northern part of the industrial portions of the site, POS has been located to contain all *Leucopogon marginatus* plants which were identified onsite. This was identified as the area of vegetation onsite with the greatest degree of environmental significance. The majority of these plants were located within the residential portion of the site, with a small number encroaching the industrial zone. These plants have been retained with an average buffer distance of 40m (15m is provided at the closest point) to support their protection.

In addition to the *L. marginatus* area, additional vegetation retention is also proposed within the north-south linear POS within the centre of the site. This POS area follows the elevated ridge line between the northern east-west POS and connects to the *L. marginatus* area in the south. As identified by Local Government Biodiversity Planning Guidelines (Del Marco et al, 2004) connection of smaller areas of retained vegetation can increase viability. The creation of ecological linkages is also a recommendation of the Geraldton LSB.

The linear POS contains vegetation from the Md and Ar vegetation units, which are both dominated by *Acacia rostellifera*. The condition of this vegetation varies from Very Good-Good to Good-Degraded.

The areas of POS which incorporate retained vegetation have all been designed to include a road interface between the POS and adjacent development areas. This will provide assistance to environmental management including minimising spread of weeds into these areas from adjacent locations and allowing for a high level of visibility / passive surveillance.

The strategy of vegetation retention within POS has been selected to allow for consolidated areas of retained vegetation. Other options for vegetation retention areas which are presented within the Geraldton LBS, including retention within streetscape and transport corridors, have not been selected for the site based on the disturbance which will occur from the site earthworks and the linear/fragmented ecological areas which are formed through these methods. As such the consolidated POS option is considered the most appropriate for the site.

It is further noted that the form of vegetation which occurs onsite (generally scrubland and low woodland) does not contain plant forms which are targeted for retention in islands, road reserves etc.

Other areas of POS located onsite will be required to fulfill drainage and community recreation functions. Where drainage and landscape designs allow, small areas of vegetation may also be retained in these areas.

Vegetation is not proposed to be retained within the industrial lots onsite, based on the extent of earthworks required to develop this area. The disturbance to the surface topography will prevent the ability to retain vegetation within these lots. The vegetation within this area is dominated by *Acacia rostellifera*. The condition of the vegetation south of the Geraldton – Mt Magnet Road is mostly Degraded to Completely Degraded. The vegetation condition within the industrial lots north of the Geraldton – Mt Magnet Road varies from Very Good to Completely Degraded. A portion of the potential industrial zoned land is proposed to be included within POS, with vegetation retention to occur in this area. This POS included retention of DRF and surrounding vegetation.

It is noted that the City of Greater Geraldton has requested that occurrences of *Melaleuca cardiophylla* are retained onsite. The vegetation unit that is proposed for retention within the linear POS contains representation of this species.



EXAMPLE OF VEGETATION BEING RETAINED IN ROAD RESERVE

02 part two: explanatory section

3.4.3 Public Open Space Schedule

The following table, prepared in accordance with Liveable Neighbourhoods, provides an indicative summary of the POS provided with the LSP area. The calculations demonstrate that approximately 13.6% of the gross subdivisible area being provided as POS. This percentage is indicative only and will be subject to refinements at the detailed subdivision design stage.

TABLE 4: PUBLIC OPEN SPACE SCHEDULE

Site Area			145.82ha
Total Net Site Area			145.82ha
Deductions			
Geraldton North-South Highway	16.66		
Light Industrial	56.69		
1 in 1 year drainage	0.28		
Total		73.63ha	
Gross Subdivisible Area (GSA)			72.19ha
Public Open Space requirement @10% of GSA			7.21ha
Public Open Space Contribution			
May comprise:			
Minimum 80% Unrestricted Public Open Space			5.77ha
Maximum 20% Restricted Public Open Space			1.44ha
Unrestricted Public Open Space Sites			
POS 1	0.1318		
POS 2	0.7300		
POS 3	1.4040		
POS 4	1.7641		
POS 5	0.8916		
POS 6	1.0227		
POS 7	0.4166		
POS 8A	0.3500		
POS 8B	2.400		
POS 9	0.3034		
POS 10	0.7000	10.1142	
Minus 1 in 1 year storm volume		0.2800ha	
Minus Restricted POS		0.2721ha	9.5621ha
Restricted Public Open Space Sites			
Total restricted use public open space contribution (less than 20% of total POS)			0.2721ha
Drainage area in POS (subject to inundation greater than 1 year ARI rainfall interval but more frequently than 5 year ARI rainfall event – i.e. between 1 and 5 year rainfall event)			
Total Public Open Space Provision		13.6%	9.8342ha
POS Surplus			2.6242ha

02 part two: explanatory section

3.5 Activity Centres

As identified in the City's Commercial Activity Centres Strategy (2013), the LSP area is currently serviced by the Large Neighborhood Centre in Rangeway and the Neighbourhood Centre in Mt Tarcoola. A proposed District Centre is to be located at Southgates and a proposed Neighbourhood Centre in Seacrest will also service the LSP area. The proposed Southgates District Centre will provide essential services, community facilities and employment opportunities to the southern Geraldton district.

3.6 Education Facilities

The residential portion of Lot 800 is within the catchment of the John Willcock College (high school) and Rangeway Primary School. The site for the Karloo Primary School is in closer proximity and will be the primary school for the LSP area once it is constructed.

3.7 Movement Network

The LSP identifies the proposed road network. The road network has been reviewed by Riley Consulting in the Traffic Report, a copy of which is provided in Appendix C. This section provides a summary of the Traffic Report.

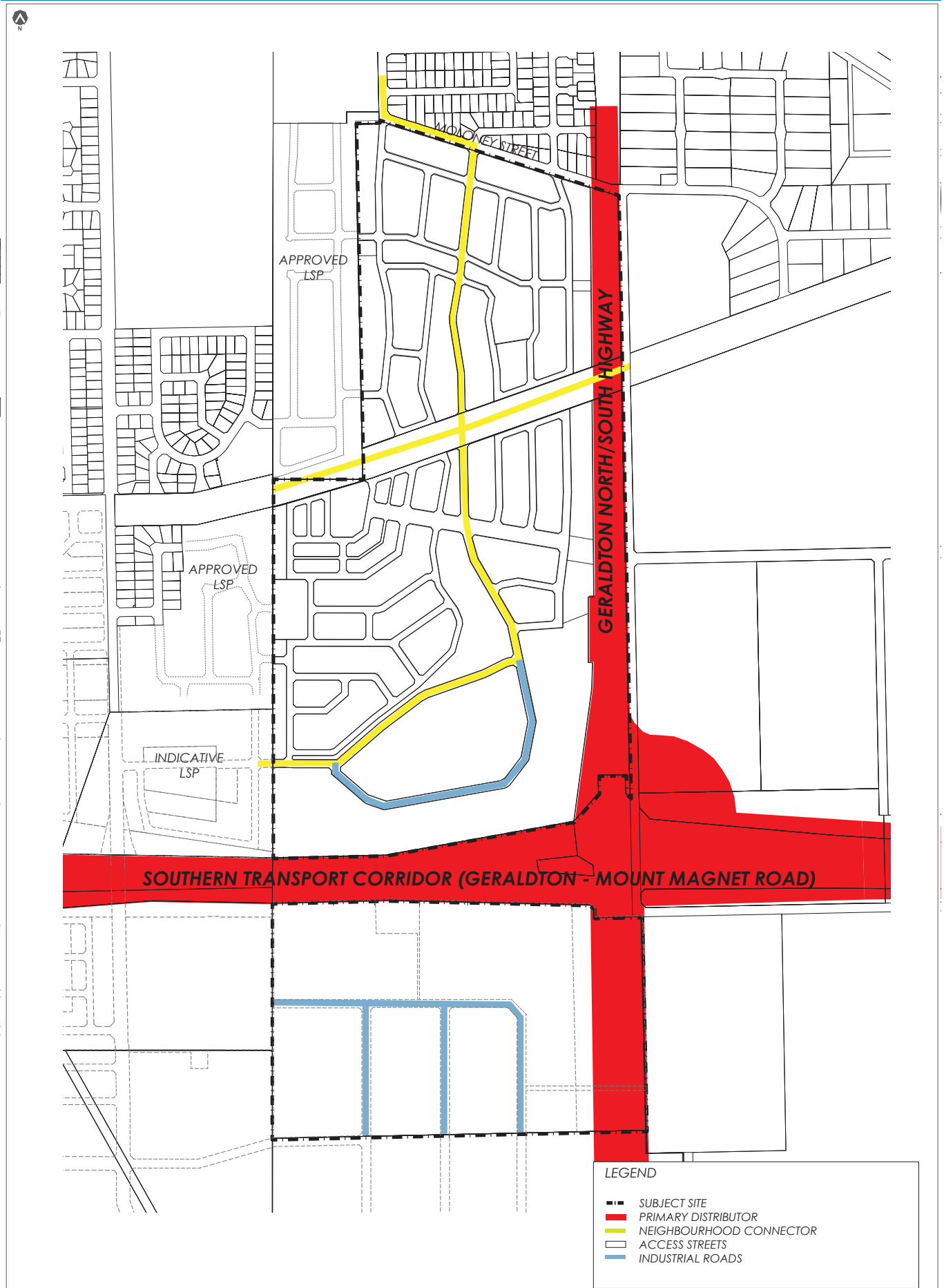
Road Network and Road Function

The proposed road network is illustrated on the Local Structure Plan (Plan 1). The primary features of the road network will be the extension Ross Ariti Road to serve as a neighbourhood road, the construction of the Geraldton North-South Highway and the construction of a north-south neighbourhood connector to serve the proposed residents and the proposed and service commercial land to the south.

The traffic model prepared by Riley Consulting has been used to determine the anticipated daily traffic flows on local streets within Lot 800 and shows that all streets can be expected to operate with daily volumes below 3,000 vehicles.

02 part two: explanatory section

FIGURE 15. PROPOSED ROAD HIERARCHY

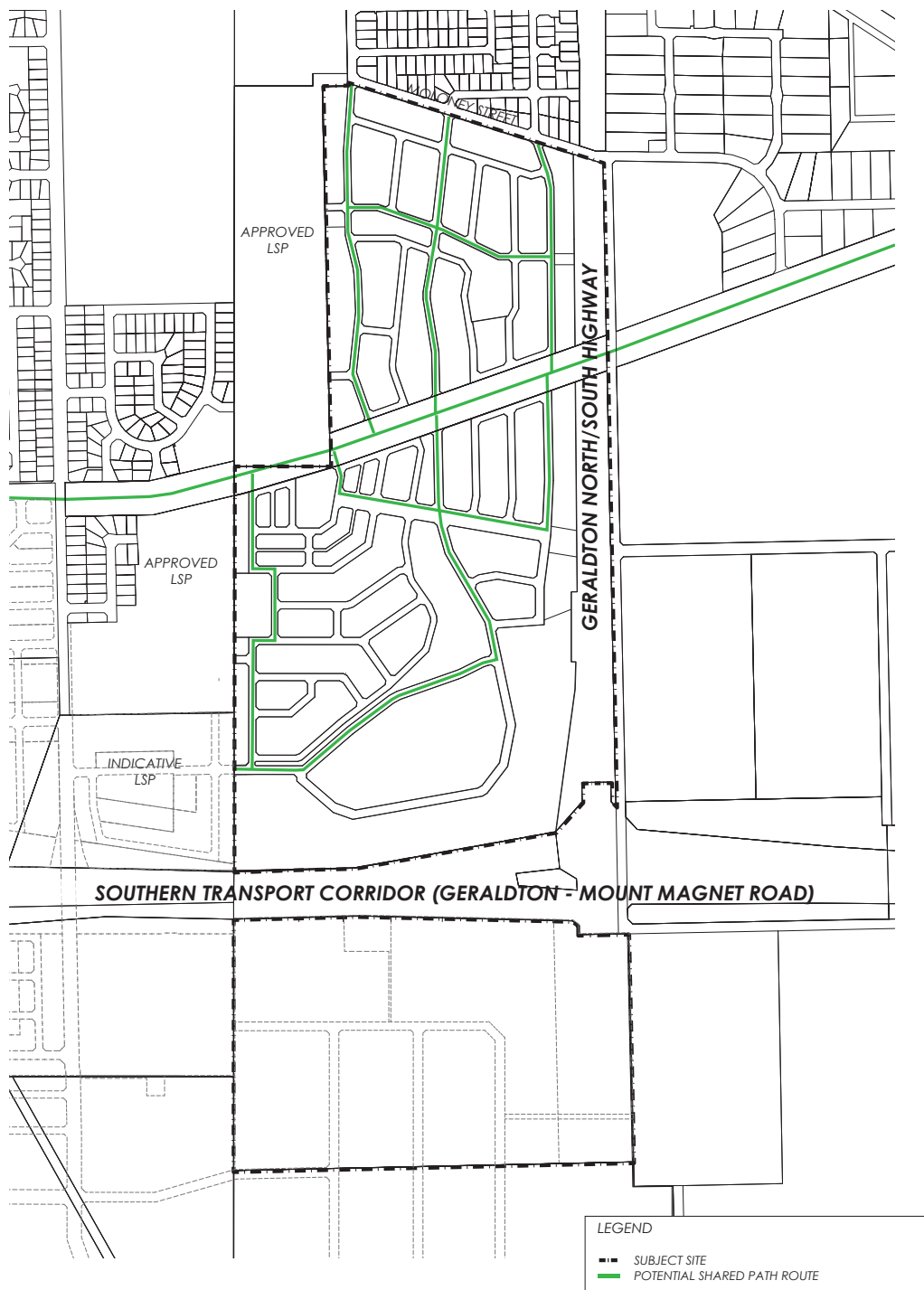


02 part two: explanatory section

Pedestrian/ Cyclist Facilities

Current planning guidelines suggest that all streets should be provided with a footpath where possible. On roads classified as Neighbourhood Connectors and above, a footpath to both sides and on-road cycle lanes should be provided (or one as a shared path). Footpaths should be constructed to current City of Greater Geraldton standards.

FIGURE 16: PEDESTRIAN + CYCLE NETWORK

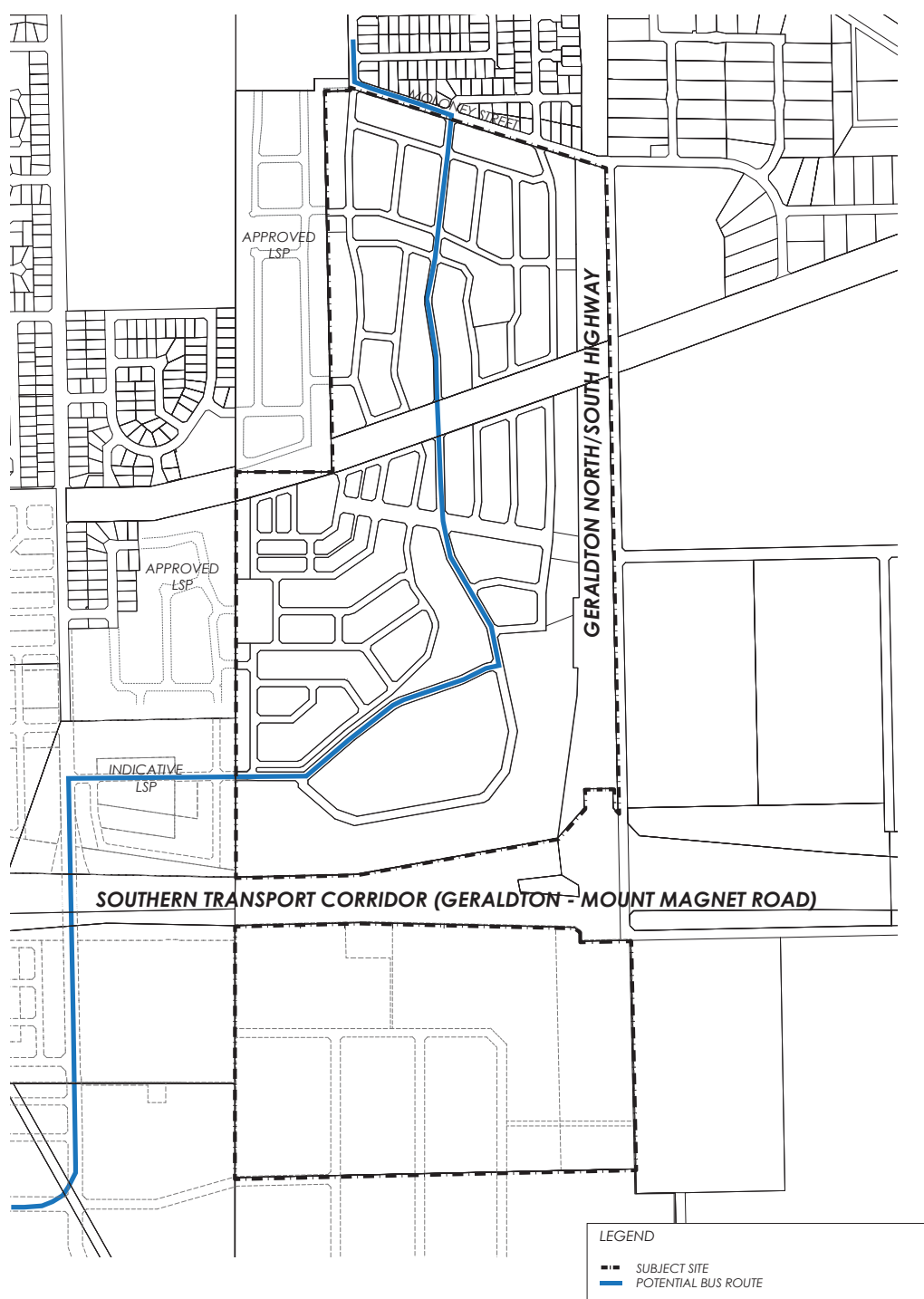


02 part two: explanatory section

Public Transport

The location of Lots 23 and 800 on the periphery of the urban front is likely to make the provision of public transport unviable in the medium term. However, planning for a long-term bus service should be considered. Figure 15 shows a long-term route for buses and a 7.2 metre wide carriageway should be provided to these streets.

FIGURE 17: PROPOSED PUBLIC TRANSPORT ROUTES



02 part two: explanatory section

3.8 Water Management

A Local Water Management Strategy (LWMS) has been prepared by Coterra to support the LSP. Refer to Appendix A. The following table summaries the key elements of the LWMS:

Key Elements	Design and Compliance to Objectives
Water Conservation Strategy	<ul style="list-style-type: none"> • Potable water will be sourced from the regional water supply scheme. • Irrigation water for Public Open Space (POS) in residential areas will be sourced from groundwater. • With the exception of drainage areas, no POS and therefore no associated irrigation is proposed within the industrial areas. If desired, industrial lots will be landscaped and irrigated by individual landowners. • Wastewater within all residential areas will be disposed of via the regional sewerage system. • Wastewater within all industrial lots will be disposed of via individual lot Alternative Treatment Units (ATUs). Where possible, local maintenance and supply companies will be used. • Educational material will be provided to lot owners to encourage water conservation within residential and industrial lots.
Stormwater Quantity Management	<ul style="list-style-type: none"> • Runoff from the 1 year 1 hour ARI event will be retained and infiltrated within individual residential lots. • Runoff from the 10 year 1 hour ARI event will be retained and infiltrated within individual industrial lots. • Excess lot runoff and road runoff up to and including the 5 year ARI event will be conveyed via a combination of roadside swale and a kerb/pipe/pit network Larger events up to and including the 100 year ARI event will be conveyed in the road reserve. • Larger events up to and including the 100 year ARI event will be conveyed in the road reserve. • Landscaped compensation basins and swales will be used to retain and either fully infiltrate or restrict post-development discharge to pre-development rates up to the 100 year ARI event.
Groundwater Management	<ul style="list-style-type: none"> • There will be no subsoil drainage or fill requirements given the significant separation distances to groundwater. • Site re-contouring will utilise in situ soils. • Separation distances to groundwater of; 1.2m for lot levels, 0.3m for the inverts of drainage swales/basins and 1.5m for ATU disposal, will be easily achievable.
Flood Risk Management	<ul style="list-style-type: none"> • Some minor earthworks will be required to facilitate the urban form of the development and for flood risk management. • Finished lot levels will be at least 0.5m above the modelled 100 year ARI flood level. • Finished lot levels will be at least 0.3m above the 100 year ARI overland flow route (within the road reserve).
Monitoring	<ul style="list-style-type: none"> • No monitoring is required pre or post development at the site as agreed with the Department of Water (DoW).
Implementation	<ul style="list-style-type: none"> • Roles and responsibilities involved in the implementation of the LWMS are identified.

02 part two: explanatory section

3.9 Infrastructure Coordination, Servicing and Staging

3.9.1 Sewer

The western and northern portions of Lot 800 are within Water Corporation's current regional wastewater planning scheme. These areas can be serviced via connection to the existing downstream infrastructure, with a linking sewer through neighbouring private properties.

The remaining areas of Lot 800 are outside the current wastewater planning. Progression of this structure plan approval will prompt Water Corporation to review and extend current planning boundaries.

Wastewater servicing can be achieved by using conventional gravity sewer networks linking to sub-regional wastewater pump stations conveying flows to regional wastewater treatment facilities.

Commercial/industrial lots won't require reticulated sewer connections. Wastewater servicing would be managed by onsite Aerobic Treatment Units (ATU's), installed at time of building construction. Each freehold lot would specify and maintain an ATU for their respective building requirements.

3.9.2 Water Reticulation

Existing Water Corporation infrastructure is not currently adequate in size or capacity to cater for the ultimate water demand for Lot 800. We envisage capacity in adjacent urban infrastructure to the west would be adequate to service the initial residential stages of Lot 800. The Water Corporation are unable to commit to this strategy at this time.

The northern portion of Lot 800 falls within Water Corporation's current urban water planning scheme. The southern portion Lot 800 falls within the Rural and Industrial water planning scheme. Both planning schemes are serviced by the existing Bootnall Tank and Allanooka Tank. Appendix B shows current Water Corporation water planning overlaid on the development plan.

To cater for the ultimate water demand, offsite infrastructure upgrade will include duplication of the existing DN600 steel water distribution main in Verita Road, up to Ackland Road, plus extension to Abraham Road across the Southern Transport Corridor.

Potable water servicing within the structure plan area can be achieved using a conventional piped network reticulation system.

The existing above ground DN600 steel distribution main between Stansfield Road and Abraham Street currently has a 10m easement central to the main. The Water Corporation advise this asset is to remain on its present alignment. There is potential for this asset to be relocated underground, however the Water Corporation have not yet confirmed this requirement.

The Water Corporation's advice and planning layouts remain subject to hydraulic studies, timing of development and Water Corporation approval.

02 part two: explanatory section

3.9.3 Power

The Western Power Feasibility Study (Appendix E) confirms that the initial stages of Lot 800 can be serviced by the existing network without the need for offsite reinforcement/upgrade works. The initial connection would come from the existing 33kV Narngulu West feeder, which is located to the south east of the site.

There are existing high voltage distribution overhead lines surrounding the northern parcels of Lot 800, with an 11kV line along Abraham St and a single phase high voltage line along the eastern boundary. The 132kV transmission line runs eastward along the Geraldton-Mt Magnet Road and turns northwards up Hardy Road.

The ultimate development will require the installation of a new 33kV distribution feeder, as the existing Narngulu West feeder will reach capacity after initial development stages. The new distribution feeder to service Lot 800 will connect into the Geraldton Substation to the north.

Power would be reticulated within Lot 800 via high voltage switchgears and transformers placed at strategic locations. Commercial/Industrial lots exceeding 8,060m² will require individual transformers to be placed on or directly adjacent the lot. All residential lots will have low voltage mains cable reticulating from transformers to standard power pillars within each lot.

Due to the dynamic nature of Western Power's network, capacity, infrastructure requirements and connection points may differ at the time when the subdivision proceeds and a Design Information Package is requested.

3.9.4 Gas

Initial stages of residential development may be possible via connection to existing infrastructure in Moloney Street and Abraham Street. However, this can only be confirmed upon formal design application.

To provide gas for the ultimate development an offsite headworks extension will be required from Goulds Road on the south side of the Southern Transport Corridor. ATCO's current modelling relies on neighbouring developments to proceed prior to this site, however it is likely an alternate upgrade may be possible subject to the staging front of this site.

3.9.5 Telecommunications

Telecommunications servicing can be provided by extension and upgrade of existing infrastructure in the vicinity. Existing communications assets are located in Moloney Street (north), Stansfield St (east) and Abraham St (west). National Broadband Network (NBN) will likely be the service provider (using Telstra's infrastructure), however, confirmation won't be received until design application is made.

02 part two: explanatory section

4.0 IMPLEMENTATION

4.1 Staging

The development of the LSP area will be implemented in stages over a period of time the duration of which will be dependent on the demand for residential housing and light industrial land.

The provision of engineering infrastructure will also need to be staged to suit the development demand and a detailed program for this will need to be prepared as a part of ongoing detailed planning and design of the infrastructure.

4.2 Planning Process

The implementation of the LSP will follow the typical development process followed with Western Australian, being:

