



BOYANUP EAST LOCAL STRUCTURE PLAN



08067
April 2016
Rev 7

This structure plan is prepared under the provisions of the Shire of Capel Local Planning Scheme No.7

IT IS CERTIFIED THAT THIS STRUCTURE PLAN WAS APPROVED BY RESOLUTION OF THE WESTERN AUSTRALIAN PLANNING COMMISSION ON: 9 FEBRUARY 2017

Signed for and on behalf of the Western Australian Planning Commission



an officer of the Commission duly authorised by the Commission pursuant to Section 16 of the *Planning and Development Act 2005* for that purpose, in the presence of:



Witness

10 February 2017

Date

Date of Expiry: 9 FEBRUARY 2027

DOCUMENT QUALITY CONTROL

AUTHOR
BOB WALLIN

DATE
21.11.2011

CHECKED BY
LARRY GUISE

DATE
21.11.2011

COPYRIGHT

THIS DOCUMENT IS AND SHALL REMAIN THE PROPERTY OF TME TOWN PLANNING MANAGEMENT ENGINEERING PTY LTD THE DOCUMENT MAY ONLY BE USED FOR THE PURPOSE FOR WHICH IT WAS COMMISSIONED AND IN ACCORDANCE WITH THE TERMS OF ENGAGEMENT FOR THE COMMISSION. UNAUTHORISED USE OF THIS DOCUMENT IN ANY FORM WHATSOEVER IS PROHIBITED.

REVISION TABLE

No.	Purpose	Date
1	O.D.P PLAN MODIFICATIONS TO MAIN ACCESS TO SUBJECT SITE.	15/03/2013
2	REVISION TO TEXT	04/07/2013
3	REVISION TO TEXT	10/03/2014
4	COUNCIL MODIFICATIONS	28/05/2014
5	COUNCIL MODIFICATIONS	23/01/2015
6	COUNCIL MODIFICATIONS	27/07/2015
7	WAPC MODIFICATIONS	14/04/2016

TME Town Planning Management Engineering Pty Ltd

PO BOX 733, BUNBURY

PH: (08) 9791 4411



CONTENTS

INTRODUCTION	1
PART 1: STATUTORY PROVISIONS.....	2
1. Structure Plan Area	3
2. Structure Plan Content.....	3
3. Planning Policy Statements	3
PART 2 – EXPLANATORY REPORT	6
1.0 BACKGROUND	7
1.1 Site and Situation	7
1.2 Land Tenure	7
1.3 Existing Development	7
2.0 NATURAL FRAMEWORK	8
2.1 Physical Features and Natural Framework.....	8
2.1.1 Landform Overview	8
2.1.2 Geotechnical Overview.....	9
2.1.3 Acid Sulphate Soils.....	9
2.1.4 Contaminated Soil Investigation	9
2.2 Environmental Overview.....	10
2.2.1 Water Bodies	10
2.2.2 Wetlands.....	10
2.2.3 Preston River	10
2.2.4 Terrestrial Vegetation	10
2.3 Aboriginal Heritage	12
3.0 MAJOR SERVICES FRAMEWORK	14
3.1 Transportation.....	14
3.2 Water Supply.....	14
3.3 Sewerage.....	14
3.4 Roads	15
3.5 Drainage.....	15
3.5.1 Pre-Development Water Conditions.....	16
3.5.2 Stormwater Management	18
3.5.3 Groundwater Management.....	18
3.5.4 Wetland and River Management.....	19
3.5.5 Drainage Plan.....	19
3.6 Power	19
3.7 Gas and Telecommunications	19
3.8 Bush Fire Control.....	19

3.9	Community Contribution Plan	20
3.10	Resource Notification Area	21
4.0	STATUTORY PLANNING FRAMEWORK	22
4.1	Greater Bunbury Region Scheme	22
4.2	Shire of Capel Land Use Strategy	22
4.3	Shire of Capel Town Planning Scheme No. 7	23
4.4	Boyanup Townsite Strategy	24
4.5	Joshua Brook Structure Plan	24
4.6	Boyanup Public Open Space Strategy	24
4.7	Urban Landscape Strategy	25
4.8	Liveable Neighbourhoods (LN)	26
5.0	CONCEPT DEVELOPMENT	27
5.1	East Boyanup Design Concept	27
5.1.1	The Vision	27
5.1.2	Design Objectives	27
5.2	Exploring Opportunities and Constraints	28
5.3	Natural Framework	29
5.4	Open Space and Recreation Framework	29
5.5	Movement and Transport Framework	30
5.6	Sustainability Outcomes	31
5.7	Precinct Visions	31
5.7.1	Preston River Village Precinct	31
5.7.2	Riverside Living Precinct	32
5.7.3	Ranch Living Precinct	32
5.7.4	Parkside Living Precinct	32
5.7.5	East Boyanup Village Precinct	32
5.7.6	Woodland Living Precinct	32
5.7.7	Boyanup Hills Precinct	33
5.7.8	Woodland Hills Precinct	33
5.8	Open Space Network Visions	33
5.8.1	Distribution of Local Open Space Areas	34
5.8.2	Design and Function of Open Space Areas	34
5.8.3	Landscape Master Planning	35
6.0	IMPLEMENTATION AND STATISTICS FRAMEWORK	36
6.1	Structure Plan Statistics	36
6.2	Staging and Timing of Development	36
6.3	Scheme Amendment Proposals	36
6.4	More Detailed Plans and Strategies	36

FIGURES

FIGURE 1A	Boyanup East Local Structure Plan
FIGURE 1B	Planning Policy Statements
FIGURE 2	Boyanup East Neighbourhood Precinct Areas
FIGURE 3	Location Plan
FIGURE 4A	Existing Conditions
FIGURE 4B	Land Ownership Details
FIGURE 5	Soil Types
FIGURE 6	Acid Sulphate Soils Analysis
FIGURE 7	Wetland Classifications
FIGURE 8	Vegetation Units
FIGURE 9	Ecological Linkages
FIGURE 10	Traffic Study Plan
FIGURE 11	Illustrations of Potential Drainage Design Solutions
FIGURE 12	Pre-Development Surface Water Conditions
FIGURE 13	Pre-Development Groundwater Conditions
FIGURE 14	Typical Cross Section of Site Showing Indicative Groundwater Levels
FIGURE 15	Extract Greater Bunbury Region Scheme
FIGURE 16	Shire of Capel Land Use Strategy
FIGURE 17	Extract Shire of Capel Town Planning Scheme No. 7
FIGURE 18	Boyanup Townsite Structure Plan
FIGURE 19	Compliance with Boyanup townsite Structure Plan
FIGURE 20	Joshua Brook Structure Plan
FIGURE 21	Boyanup Public Open Space Strategy Map
FIGURE 22	Opportunities and Constraints Map
FIGURE 23	Natural Framework
FIGURE 24	Open Space and Recreation Framework
FIGURE 25	Movement and Transport Framework
FIGURE 26	Distribution of Open Space
FIGURE 27	Landscape Master Plan
FIGURE 28	Structure Plan Statistics
FIGURE 29	Staging Plan
FIGURE 30	Sustainability Strategy

INTRODUCTION

The Boyanup East Local Structure Plan (Boyanup East Plan) has been prepared to guide the future development and subdivision to create a vibrant community consisting of a number of small, distinctive neighbourhoods set within a well planned, attractive and sustainable open space network.

The vision for East Boyanup Plan is to create a sense of place through the establishment of a small number of distinctive neighbourhoods with a village lifestyle aesthetic, set within a sustainable, safe and attractive open space environment that promotes local pride and healthy lifestyles.

The aim is to create a small number of diverse, unique and attractive neighbourhoods with a unique village character, set within an attractive and sustainable open space network that is serviced by a well connected and highly accessible civic, community and commercial centre.

The East Boyanup Plan is in two parts.

Part 1 contains the statutory provisions to assist the Capel Shire and State government agencies in assessing statutory applications and ensuring the orderly development of the East Boyanup Plan. The East Boyanup Plan is located at the end of this section and supported by a number of addendums. There are eight precincts within the East Boyanup Plan area, each characterised by location, design and guiding planning principles.

Part 2 is the explanatory report which describes the vision, principles and proposals for the East Boyanup Plan.

PART 1: STATUTORY PROVISIONS

1. STRUCTURE PLAN AREA

- 1.1 This structure plan shall apply to the land contained within the inner edge of the line denoting the structure plan boundary on *Figure 1A - Boyanup East Local Structure Plan* and *Figure 1B - Planning Policy Statements*.

2. STRUCTURE PLAN CONTENT

- 2.1 This structure plan comprises:
- a) Part 1 - Statutory
This section contains the structure plan map and statutory planning provisions and requirements.
 - b) Part 2 – Non-statutory
This section is to be used as a reference guide to interpret and justify the implementation of Part One.
 - c) Appendices
This section contains technical reports, plans and maps supporting the Structure Plan.

3. PLANNING POLICY STATEMENTS

- 3.1 This structure plan provides a basis for zoning (including residential density) and subdivision of land and will be given due regard when determining applications within the structure plan area, including consideration of the objective and requirements of the scheme zones proposed by the structure plan.
- 3.2 Subdivision and development shall be generally in accordance with this Local Structure Plan, Appendix 16 of Town Planning Scheme No. 7, any associated local development plans, landscape plans and design guidelines, Liveable Neighbourhoods and the Residential Design Codes.
- 3.3 Subdividers will be required to make adequate contributions towards community facilities consistent with the development contributions plan, as articulated by a scheme amendment to the local planning scheme.
- 3.4 Prior to the approval of subdivision or development, the Shire may require the preparation and adoption of 'design guidelines' for specific development proposals - the guidelines will be required to promote themes which relate to Boyanup.
- 3.5 Prior to the approval of any subdivision the subdivider is to submit for approval by the Shire a detailed staging plan and mechanisms to achieve:
- the coordination of landowner responsibilities in relation to servicing arrangements,
 - the construction and/or upgrading and timing of servicing infrastructure, including the main roundabout and other road infrastructure, and any required land acquisition,
 - provision of the school site, community purposes site and local centre

- provision of any sports ovals and/or playing fields
 - provision/construction of shared paths, pedestrian paths and pedestrian bridge,
 - the provision and development of POS,
 - contributions to community facilities.
- 3.6 Prior to the approval of subdivision a 'shared path and pedestrian path plan' shall be prepared by the subdivider which provides for connectivity to the existing network in the locality including to community focal nodes in the Boyanup town centre and the timing and funding of the construction of the pedestrian bridge over the Preston River - footpaths are to be provided within all road reserves in accordance with 'Liveable Neighbourhoods' and relevant Shire requirements.
- 3.7 Prior to the approval of subdivision the subdivider shall submit foreshore management plans for foreshore areas which address:
- a. environmental values,
 - b. risk management (flood, fire etc),
 - c. mosquito habitat management,
 - d. ongoing sustainability and reserve management mechanisms,
 - e. implementation responsibilities,
 - f. vesting/management arrangements,
 - g. development restrictions in wetland buffer areas.
- 3.8 Prior to the approval of subdivision detailed landscape plans for POS, drainage areas and road reserves shall be prepared by the subdivider having regard to:
- a. Shire of Capel Urban Landscape Strategy,
 - b. East Boyanup Landscape Master Plan,
 - c. Boyanup Public Open Space Strategy,
 - d. application of waterwise landscaping principles and species selection,
 - e. Shire standards for stormwater detention in POS and multiple use corridors,
 - f. provision of adequate car parking, pathways, park furniture, recreation facilities and playgrounds in POS,
 - g. identification of adequate vegetated buffers at the interface of residential expansion and the surrounding rural areas,
 - h. subdivider responsibilities for implementation and management of landscaping, and
 - i. ongoing sustainable maintenance.
- 3.9 Prior to subdivision a Detailed Fire Management Plan is to be prepared for the subject land which also addresses surrounding areas where bushfire hazards are evident that could impact the subject land.

- 3.10 Prior to development of the local centre site a local development plan shall be prepared for the site having regard to the relevant requirements of Town Planning Scheme No. 7 - the plan shall include detailed urban design standards/guidelines for matters including floor space, building design, building height/bulk, finishes, traffic and pedestrian management, car parking, landscaping, street furniture, pavement treatments, control of advertising signs and the intended staging and timing of development.
- 3.11 The mosquito management plan shall:
- a. reference to the need for Water Sensitive Urban Design to use the Department of Health's risk assessment guide re: mosquito breeding and prevention of mosquito breeding areas, and
 - b. include advice on mosquito management from the Department of Health in Wetland Management Plans and Urban Water Management Plans e.g. 'Chironomid Midge & Mosquito Risk Assessment Guide to Constructed Wetlands'.
- 3.12 Subdividers shall ensure that the alignment of roads and streets is designed to minimise disturbance to vegetation and that mechanisms are in place for the protection of remnant vegetation during subdivision works.
- 3.13 Subdividers shall establish a mechanism e.g. management plans, to ensure that dust and noise creation from subdivision works is adequately managed to prevent nuisance to nearby residents during construction.
- 3.14 Subdivision design and development of Lots 116 and 117 shall not result in the imposition of management obligations on the adjoining State Forest. Subdivision design, lot layout and building envelopes in these areas are to be informed by a bushfire Management Plan and protection of significant biodiversity values.

PART 2 – EXPLANATORY REPORT

1.0 BACKGROUND

1.1 Site and Situation

The subject land is located within the Shire of Capel, approximately one kilometre due east of the Boyanup Town Centre and approximately 20 kilometres south east of Bunbury (see *Figure 3*).

1.2 Land Tenure

This East Boyanup LSP provides detailed planning investigation for land identified within the Boyanup Townsite Strategy east of the Preston River.

There is a significant number of individual small land owners located within the LSP area. The LSP design provides a future settlement pattern demonstrating how these lots can be developed. It is noted that these areas will require the preparation of further planning documentation, including Detailed Area Plans prior to subdivision being considered to ensure the orderly provision of roads, open space and essential services.

1.3 Existing Development

The site is characterised by a fragmented ownership consisting of a range of small rural holdings as well as smaller historical residential style lots. There is a planned “special residential estate” that has been fully developed (Joshua Brook Estate) on the southern edge of the subject land.

Cotton Holdings has purchased a significant number of lots with the aim to create a residential estate that has access to appropriate services and infrastructure (see *Figure 4B*). The majority of the remaining landholders have not been financially involved in the preparation of this plan and would have various motives/timelines and intentions for future development.

Lots range in size from approximately 1000m² to 38ha. Ownership details and land areas are displayed in *Figures 4A* and *4B*.

The extent of the existing road network is shown in *Figure 4A*. There is an existing private school located at the intersection of Armstrong and Stephen Streets.

The majority of the land is cleared with a central section running north south containing rehabilitated mining voids. There are sections of remnant vegetation located along the Preston River, southern edge and middle section to the east of the mining voids.

There are a number of sections that contain rehabilitated vegetation, with the main areas being around the mining void and the eastern edge abutting State Forest land.

There are a number of small landholdings that contain existing dwellings and outbuildings and other improvements. These are mainly located on the western half of the structure plan area.

The design of the structure plan has been prepared to preserve existing dwellings and where possible, enable individual owners to subdivide and obtain road access independent of other landowner intentions.

The main exception to this principle relates to the proposed intersection location to connect to Boyanup-Picton Road if the MRWA suggested option is used this option will require significant land acquisition and removal of some existing improvements.

2.0 NATURAL FRAMEWORK

2.1 Physical Features and Natural Framework

Contours range from approximately 30m AHD in the west up to 95m AHD near the eastern-most boundary of the subject land.

The site contains:

- Significant portions of remnant vegetation;
- An existing special residential estate (Joshua Brook);
- A specialised private primary school;
- Pockets of smaller lots with existing dwellings, both residential and special rural scale;
- Two mining voids; and
- Areas of cleared land and areas of rehabilitated mining land (see *Figure 4A*).

2.1.1 Landform Overview

The LSP area is composed of a number of distinct land forms (*Figure 4A*).

Just outside the western boundary flows the Preston River. This is ultimately the current drainage point for the majority of the site. The river flows in a northerly direction. It is approximately 30m AHD where it borders the site. There is a small gully that cuts directly back into the site from the river near the south west corner. The river and gully banks rise sharply to approximately 35m AHD. The floodway is contained within this defined area.

Moving east from the river is a relatively flat clay/loam plain. This plain extends eastward for approximately 1km until the 45m AHD contour. The plain tends to be seasonally wet with a high water table. Situated in this plan are two large mining voids that have been rehabilitated. Part of the land surrounding these voids now drains towards these voids.

At the 45m AHD contour the land starts to slope gently upwards on an approximate 3% slope. The slope increases in the east and south east, with very small sections reaching 20% plus. The general slope in the eastern area is around 5-7%. The slope tends to fall to the north-west over the majority of this area. In the far south eastern corner the site reaches a maximum of 95m AHD. A minor gully intersects the slope.

In the south western area of the site the land tends to slope southward at approximately 8% toward Joshua Brook. This area is heavily vegetated.

There is also some historical excavation and backfilling in the far north eastern corner. This area has been used as a landfill site. Excavation (without landfill) has also occurred in the south eastern corner. This has changed the surface level of these areas to a minor degree.

2.1.2 Geotechnical Overview

There are a number of soil types across the site. *Figure 5* shows the general layout of each known soil type as a solid colour. Those areas with dotted boundaries have been extrapolated from samples taken nearby.

In general, the site has loamy clay soils close to the river moving to sands/silty sands over clay sands on the flat areas. At the base of the rise is a large area of mining fill which is composed of a range of soils. On the slope areas, the predominant soil types are sand/sandy clay in the north eastern areas moving through sand/silty sand over clayey sands in the middle to sand over ferricrete in the south east. In the far eastern area of the site there is a strip composed of fill from mining activities, which exhibits a range of soils.

Geotechnical investigations have been undertaken for land within the Cotton Holdings landholdings by Coffey and GHD. The Coffey field work was undertaken in August 2008 and the GHD field work in January 2001. Coffey also undertook a Preliminary Site Investigation that focused on potential contamination issues associated with past land uses. Further geotechnical studies will be undertaken as land is identified for development.

A significant portion or all of Lots 98, 115, 116, 117, 143, 144 and 145 are identified as comprising part of a 'Sand Mining' site (white in *Figure 5*) for which there is no information available in respect of land qualities and capabilities. Further investigations, including geotechnical and land capability analysis, will be required to determine the suitability of the land with respect to alternative development proposals. The LSP proposes that this area be excluded from urban development consideration at this stage unless detailed geotechnical investigations confirm acceptable standards can be obtained.

2.1.3 Acid Sulphate Soils

Based on the results of laboratory and site testing conducted, the site has relatively low risk of containing large quantities of acid generating soils. Acid generating soils were located in only 2 pits (see *Figure 6*). This verifies information supplied by the Department of Water as to the ASS risk within 3m of the soil surface. This shows the majority of the site to have a low to medium risk. The high risk areas associated with the Preston River main channel are not likely to be significantly impacted by the proposed development. Detailed ASS studies will be conducted as necessary in areas where the soil is to be disturbed.

2.1.4 Contaminated Soil Investigation

Preliminary site investigations that focused on potential contamination from previous land uses were undertaken. These investigations show that the land used for mining is now suitable for unrestricted use. This is based on the close out report accepted by the State Mining Engineer.

Soil samples were also taken to determine other contamination issues associated with the landfill site. The soil samples were collected and tested against two relevant contamination criteria. There were:

- HIL-A criteria: assess suitability of the soil for residential uses; and,
- EILs criteria: DoE (2003) default criteria to determine the potential for environmental impact.

None of the samples exceeded the two criteria for the selected elements. Based on these investigations, there is no evidence of soil contamination present that would preclude residential development of the site or have an effect on the sites natural environment, including water dependent ecosystems.

2.2 Environmental Overview

2.2.1 Water Bodies

Two surface water bodies lie within the structure plan area, one in Lot 90 and 91 and another in Lot 48. Both are rehabilitated mining voids and accordingly, are not of any “natural” ecological significance to the area but are still likely to provide some limited habitat for waterbirds, when water is present, as well as frogs and other aquatic fauna species. The edges of the water bodies have been revegetated with predominately non-endemic flora species. The most southern water body is reserved as Public Open Space (POS) and is under the management of the Shire of Capel.

2.2.2 Wetlands

The western third of the site is classified as Multiple Use Wetland. Due to extensive clearing, agricultural development and residential uses, there is very limited ecological value within this wetland system. The Preston River and part of Joshua Brook are classed as Conservation Category Wetlands (*Figure 7*).

2.2.3 Preston River

The Preston River is located to the west of the site. It adjoins the LSP area in the north western portion and has a perennial flow.

The Preston River has been modified from its original natural state. Modifications that affect the LSP area include a weir directly downstream of the Boyanup Picton Road, which forms a permanent pool that stretches back along part of the LSP boundary. For most of its length, the river retains a good over storey of native vegetation along its banks with a significant understorey weed load.

The vegetated banks provide habitat refuge for a range of fauna, as well as a corridor for fauna movement. The permanent pools provide important habitat for aquatic fauna and water dependent bird life.

2.2.4 Terrestrial Vegetation

Around two thirds of the LSP area has been cleared. Much of the remaining vegetated areas have been degraded in some way. A significant portion of bush is currently located in residential half hectare “bush blocks”. There are several areas of remnant bushland in good condition. It is the EPA’s opinion there is regionally significant remnant vegetation on Part Lot 97 and Lot 139 Armstrong Street and Part Lot 138 Timperley Road which should be conserved and appropriately managed as part of any future zoning, subdivision and or development on the site (EPA 2003).

2.2.4.1 Vegetation Communities

A vegetation assessment of the Cotton Holdings land has been undertaken by Strategen (see *Appendix 7*). This report identified flora present, bushland conditions, likely fauna species present as well as the quality of existing constructed wetlands from mining. More detailed vegetation assessments of other landholdings with existing vegetation will need to be undertaken prior to subdivision.

Figure 8 identifies three vegetation units, described as follows:

Vegetation Unit A – Woodland of *Eucalyptus marginata* (Jarrah) over Open Low Woodland A of *Eucalyptus marginata* and *Corymbia calophylla* over Open Low Woodland B of *Banksia grandis* and *Xylomelum occidentale* over Low Scrub B of *Xanthorrhoea brunonis*, *Davesia physodes*, *Boronia spathulata* and *Hibbertia vaginata* over Dwarf Scrub C of *Hypocalymma robustum*, *Hovea trisperma*, *Dasypogon bromeliifolius*, *Scaevola calliptera* and *Labichea punctata* over Very Open Herbs of *Burchardia congesta*, *Dampiera linearis* and *Caladenia lateriflora* and Very Open Tall Sedges of *Tetraria capillaries* and *Patersonia umbrosa* on shallow gravelly sand.

Vegetation Unit B – Open Low Woodland of *Eucalyptus marginata* over Open Low Woodland A of *Banksia attenuate*, *Eucalyptus marginata* and *Xylomelum occidentale* over Open Low Woodland B of *Eucalyptus marginata*, *Banksia attenuate* and *Nuytsia floribunda* over Open Low Scrub A of *Acacia extensa* and *Jacksonia furcellata* over Low Scrub B of *Acacia pulchella*, *Adenanthos meisneri*, *Melaleuca thymoides* and *Philotheca spicata* over Low Scrub B of *Conostephium pendulum*, *Dasypogon bromeliifolius*, *Pimelea rosea* and *Stirlingia latifolia* over Very Open Herbs of *Conostylis aculeate* and *Lagenophora huegelii* and Open Low Sedges of *Phlebocarya ciliate* and *Johnsonia lupulina* on grey sand.

Vegetation Unit C – Woodland of *Eucalyptus marginata* and *Corymbia haematoxylon* over Open Low Woodland A of *Corymbia haematoxylon* and *Xylomelum occidentale* over Low Scrub A of *Acacia pulchella* and *Hakea amplexicaulis* over Low Scrub B of *Daviesia presissii* and *Xanthorrhoea brunonis* over Dwarf Scrub C of *Boronia spathulata*, *Hibbertia hypericoides*, *Hibbertia amplexicaulis* and *Xanthorrhoea gracilis* over Open Low Sedges of *Desmocladius fasciculatus* and *Patersonia umbrosa* on shallow gravelly sand.

2.2.4.2 Vegetation Condition

The condition of vegetation Units A and B were scored as “Very Good” (vegetation structure altered, obvious signs of disturbance). Unit C was scored as “Good” (vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it).

“Paddock trees” within Lots 94 and 9003 were scored as “Completely Degraded” as the vegetation structure is no longer intact and the area has been severely disturbed by land clearing for agriculture.

2.2.4.3 Conservation Significance

The conservation value of the vegetation generally relates to its regional extent, representation within reserves and uniqueness of its component flora. Vegetation units A, B and C are of moderate to high regional conservation significance. Vegetation Area C may be of lower significance given it is small and may not be viable in the long terms as it is isolated from larger remnant blocks of vegetation and subject to edge effects.

2.2.4.4 Ecological Community and Flora Assessment

An ecological community is a naturally occurring biological assemblage that occurs in a particular type of habitat. A threatened ecological community (TEC) is one which is found to fit into one of the four categories; “presumed totally destroyed”, “critically endangered”, “endangered” or “vulnerable”. Possible TECs that do not meet survey criteria are added to a “Priority Ecological Communities” (PEC) list.

A site survey, combined with a database search has concluded that there are no TEC or PEC’s on the site.

2.2.4.5 Declared Rare Flora and Priority Flora Species

A database search and field investigation has confirmed the occurrence of *Acacia semitrullata* (Priority 3) occurs in Vegetation unit B. No other Declared Rare Flora (DRF) or Priority flora species were encountered during the field investigation.

2.2.4.6 Fauna Assessment

A recent search (2008) of the DEC Threatened Fauna database identified 3 Threatened and Priority Fauna species likely to occur within and immediately adjacent to the proposed development area. However, it was concluded that it is unlikely that any of these conservation significant species occur within the LSP.

2.2.4.7 Evaluation of Conservation Values of Study Area

The Level One Flora and Fauna assessment recommends that:

- a. Units A and B be reserved for Public Open Space or a 5.7ha “conservation lot” be created with a building envelope outside the vegetation area; and,
- b. Rehabilitation area adjacent to units A and B to be adequately protected.

2.2.4.8 Ecological Linkages

The LSP area is bound by two ecological linkages (see *Figure 9*). These linkages form part of the Capel/Boyanup Ecological link (runs along Preston River) and the Mclarty/Kemerton/Twin Rivers/ Preston river/ Gwindinup ecological Linkage (runs along southern boundary of LSP area).

The LSP design ensures that these linkages are maintained and future foreshore management plans will be developed to enhance the values of these linkages.

2.3 Aboriginal Heritage

An Aboriginal Heritage Survey has been undertaken for the subject land (see *Appendix 4*). This included an ethnographic survey for the whole structure plan area and an archaeological survey for the lots owned by Cotton Holdings.

Archival research identified one previously recorded site (ID 19795) Preston River to the edge of western boundary of the project area. No works are planned within this area and a foreshore management plan will be required. If development is proposed within this area, additional consultation will be required with the Nyungar community.

Following consultations with the Gnaala Karla Booja Native Title Claim group and persons with historical interest in the region, no ethnographic sites as defined by Section 5 of the Western Australian Heritage Act (1972) were identified to be located within the project area.

The survey recommended to:

- a. Establish a 50m vegetation buffer zone from all watercourses in particular Site ID 19795 Preston River;
- b. Establish a building envelope within each proposed residential lot to limit the removal of trees and vegetation;

- c. Ensure that prior to clearing any trees within the project area an inspection is made to establish that no scar trees are going to be disturbed. If any scar trees are identified, then they should be preserved where possible;
- d. Rehabilitate the land on the northern side of Armstrong Road to the same standard as the lake on the southern side; and,
- e. Any altering of plans that will impact on the Preston River will require further community advice.

The proposed structure plan design will not impact on the Preston River and proposes to retain remnant vegetation where possible. Further, it is proposed to upgrade the standard of the northern lake.

3.0 MAJOR SERVICES FRAMEWORK

3.1 Transportation

The LSP area is situated to the east of the existing Boyanup Townsite. The alignment of the Preston River limits the points of connectivity to the townsite and wider regional road network.

A traffic study prepared by Shawmac (see *Appendix 8*) concludes that the East Boyanup LSP provides a balanced traffic distribution through the subdivision and a smooth integration with the existing road network. It is estimated that the East Boyanup LSP will generate approximately 9700 trips per day and attract approximately 200 school trips per day when fully developed.

The study concludes that:

- a. Internal intersections will operate at acceptable levels of service, with roundabouts being suggested at some of the intersections to facilitate traffic flow, slow down internal traffic speeds and provide a safe environment for residents;
- b. The intersection of Hurst Road and Picton-Boyanup road will require a roundabout to cater for the anticipated increase in traffic due to the East Boyanup Development; and,
- c. Foot paths are recommended for all local roads with a connection to the existing pathway along Picton-Boyanup Road that runs from Hurst Road, across the Preston River Bridge into the Boyanup townsite.

Figure 10 shows the existing road network. Prior to subdivision, a traffic implementation strategy will be prepared to setup a framework for the timing, staging and contribution arrangements necessary to ensure the safe and orderly upgrading of the road network to accommodate growth.

The roundabout intersection of Hurst Road and Picton-Boyanup Road will be incorporated into a widened Primary Regional Road Reservation under the Greater Bunbury Region Scheme. This will provide certainty to landowners and the Shire that a suitable mechanism for the establishment of the road reserve is in place.

3.2 Water Supply

The Water Corporation has indicated that the water storage facility on Armstrong Road may require upgrading. These works will be pre-fundable.

Full water reticulation (including fire hydrants) will be supplied to the LSP Area.

3.3 Sewerage

The original townsite was sewered some 7 years ago as part of the Water Corporation's Infill Strategy. The current infrastructure terminates at the Boyanup Tavern on Bridge Street. The East Boyanup LSP Area will be sewered (gravity water-borne) to a pre-fundable pump station to be constructed on the northern side of the Picton-Boyanup Road bridge.

The current Water Corporation sewer catchment boundary does not encompass the entire site. However, the Water Corporation has indicated that this could be amended to include the entire area.

3.4 Roads

Road aesthetics, including verge treatments will be used to define individual precincts and provide local identity.

Road infrastructure will be provided with a full suite of hierarchical functionality and standards consistent with the recommendations of the traffic study.

A Dual Use Path Strategy will also be prepared to confirm locations based on acceptable design parameters.

Road aesthetics (ie asphalt finish, intersection threshold treatments, traffic calming measures etc) will be discussed, negotiated and agreed with the Shire of Capel at the subdivision stage.

3.5 Drainage

Water Sensitive Urban Design requires drainage to be considered as an integral component to the functioning and design of the structure plan. In East Boyanup, the philosophy is to look beyond drainage as purely functional component of development. Water sensitive drainage design provides opportunities to define and enhance the aesthetics of urban form. Physical drainage infrastructure will be constructed and designed to incorporate local materials to complement and enhance open space and the public realm. *Figure 11* illustrates opportunities available for drainage treatments to enhance urban settings.

A Local Water Management Strategy (LWMP) has been prepared for the LSP area. This LWMS proposes to ensure water management for the LSP is based on best practice water sensitive urban design. This ideal is to be achieved through maximising the sustainable use of water resources, working with and enhancing the existing ecological systems and managing stormwater to Department of Water guidelines.

The LSP area is part of the Leschenault catchment which flows into Leschenault Estuary and Koombana Bay via the Preston River. Actions will ensure the protecting and enhancing these ecosystems through utilising best water management practices. In summary, the LWMP proposes the following initiatives and outcomes associated with stormwater management, groundwater management and wetland and river management:

Initiatives being investigated include:

- Encouraging householders to install rainwater tanks for non-potable uses both inside and outside the dwellings;
- Encouraging the use of water wise fittings at construction;
- Options for water wise landscaping packages for new dwellings that include low water use gardens and soil amendments to minimise water and nutrient loss;
- Minimising water use in public open space through the use of low water use landscaping treatments, suitable vegetation, soil amendments and water efficient irrigation systems;
- Using mining voids as lakes;
- Incorporating drainage in linear open space; and,
- Promoting bio-retention through rain garden infiltration.

3.5.1 Pre-Development Water Conditions

3.5.1.1 Pre-development Surface Water Conditions

The Boyanup East LSP area is in the Preston River Catchment.

Surface water on the site flows to four main areas. These are the Preston River (directly), Joshua Brook (which flows to the Preston River), basins for farmland irrigation (with infiltration to groundwater and overflow to the Preston River) and the rehabilitated mining void wetlands (which infiltrate to the groundwater). A number of catchments also have no significant surface drainage from them. Catchments 1, 13a and 13b are Catchments that are outside East Boyanup LSP area. However, these flow into the subject land.

Figure 12 shows the individual catchments with pre-development flows.

The 1:100 ARI flood line for the Preston River at Boyanup has not been established formally. However based on advice provided by the Department of Water and historical information from the 1964 floods, it is likely that the 1:100 ARI is approximately 33m AHD at the townsite.

Mining Voids

The southern rehabilitated mining void water body is reserved as Public Open Space and is under the management of the Shire of Capel, currently water from Catchment 15 flows directly into this water body.

Catchment 14 flows directly into this water body with Catchments 13a and b discharging into Catchment 14. A gully channels most of the flow from Catchment 14.

The majority of water that flows into these water bodies infiltrates into the groundwater. No water currently leaves these mining voids by surface flow.

Northern flow

Catchments 1 and 2 flow into farmland to the north and enter a holding dam. This water is used to supplement agricultural irrigation. Catchments 3 and 4 also flow along Gray Road, with uncontrolled overland flow into the adjacent northern farmland. Catchment 5 flows into the rail reserve and Boyanup Picton Road.

Preston River

Catchments 6, 7d, 17, 18 and 19 flow directly to the Preston River. Catchments 7, 8, 9 and 16 also flow indirectly into the river via roadside swales and culverts.

Joshua Brook

Catchment 20 is the only major area that flows towards Joshua Brook. There are no defined flow paths and the water moves mainly as overland sheet flow.

Trapped Catchments

Catchments 10, 11 and 12 have adequate storage up to the 1:100 ARI event resulting in no overland flow off these catchments. Water is removed from these catchments mainly via groundwater infiltration and evaporation.

Wetlands

The western portion of the site is considered to be a Multiple Use Wetland, due mainly to the seasonally inundated and water logged soils on the plain. Catchments 10, 11 and 12 have no outflow under the 1:100 ARI with many of the other western catchments having significant infiltration of surface water.

3.5.1.2 Pre-development Groundwater Conditions

Shallow Superficial Aquifer

Groundwater levels have been investigated as part of the Boyanup East Groundwater Investigation by JDA. This report used information from previous works. As part of these investigations, over 30 bores were installed across the site. Pump tests were also undertaken to determine the mining void infiltration rates. From these investigations, the maximum groundwater levels for the site have been predicated. These are shown in *Figure 13*.

Groundwater generally flows towards the Preston River (30m AHD base) from the Whicher Scarp in the east (70m AHD groundwater contour. In addition, groundwater seeps into the river due to the approximately 10m difference in groundwater contours between surrounding areas and the base of the Preston River.

The mining voids also create a zone of depression with groundwater flowing towards these as well. *Figure 14* shows this in cross section.

It is likely that there are areas of perched groundwater on the eastern slopes. These will be determined in more detail through future monitoring.

The western flats are known to be water logged after extended rainfall during winter. This is partly attributed to the high groundwater level and low level of drainage. The peak groundwater level is predicted to be between 2m and the surface over most of this section.

Deeper Confined Aquifers

The Leederville and Yarragadee confined aquifers occur under the East Boyanup LSP area. The Leederville can be found from approximately 20m under the soil surface. Neither is known to express into the superficial aquifer on the site. There is no allocation available from either of these aquifers for use in the subdivision.

Groundwater Quality

Groundwater quality has been sampled through a network of bores down gradient of the old landfill site.

The analytes sampled for were:

- Metals comprising AS, CD, Cr, Cu, Hg, Ni, Pb and Zn;
- Nutrients and inorganic parameters;
- TPH;
- BTEX; and,
- PAHs.

The results were compared against 3 sets of guidelines:

- Fresh Water Guidelines – to provide a conservative benchmark for effects on the areas ecosystems;
- Australian Drinking Water Guidelines – to provide a benchmark for potential human consumption; and,
- Long Term Irrigation Water Guidelines – to assess the general suitability of the water for agricultural or other irrigation uses.

The results indicate that none of the analytes exceed the drinking water criteria. CR, Cu, Ni, Zn levels were above the recommended levels for Freshwater Guidelines. NH₄-NO_x-N and Total-N exceeded both Fresh Water and Long Term Irrigation guidelines.

Due to the low permeability of the soils and distance to the nearest natural water body, it is unlikely that these elevated levels will have any appreciable negative effect on the local river ecosystems.

The low groundwater yields in the region of the sampling also make it unlikely that this water will be used for irrigation.

The elevated nitrogen based results may be the results of elevated natural background concentrations as samples taken up gradient of the landfill site had similar elevated readings.

3.5.2 Stormwater Management

The LWMS seeks to ensure peak outflow from the LSP area to close to the pre-development levels through:

- Storage and infiltration on site, including utilising the existing mining voids for storage and infiltration of storm events;
- Use of swale systems where possible that clean and transport water through the development;
- Including bio-retention units in road reserves and POS areas that store, treat and infiltrate the 1 in 1 year event; and,
- Implementing a stormwater treatment train system that improves water quality to Department of Water targets for nitrogen, phosphorus and total suspended solids, reduction through the use of soil amendments, infiltration swales, infiltration ponds and bio-retention systems.

3.5.3 Groundwater Management

Groundwater management for the LSP will include:

- Filling the site where necessary so that appropriate clearance is maintained between AAMGL and surface level on residential and commercial lots;
- Monitoring of groundwater levels on the site for at least 2 winters to determine AAMGL;
- Installing sub-surface drainage at the current AAMGL to stop groundwater rise above this level; and,
- Use of soil amelioration products and treatment of water prior to entry into the mining voids to ensure surface water entering the groundwater is of a good quality.

3.5.4 Wetland and River Management

Wetland and river management will include:

- Maintaining pre-development levels of flow into the Preston River and associated wetlands with good quality pre-treated water;
- Creating foreshore reserves as abutting land is developed;
- Ensuring preparation and implementation of foreshore management plans; and,
- Creation of multiple-use corridors to incorporate living streams and revegetated mining basins that contain permanent water.

3.5.5 Drainage Plan

A full drainage study is currently being undertaken. This study will:

- Confirm pre-development runoff volumes (including existing development to date) within the LSP Area; and,
- Predict post development runoff after completion of full development.

The study includes disposal options, water balance and treatment. A LWMP is also being prepared for submission to the Department of Water.

3.6 Power

Three-phase power exists along the southern verge of Armstrong Road terminating at the Telstra mast.

Under Ground Power Development (UPD) believe that adequate infrastructure and capacity exists, however, this is subject to Western Power confirmation.

3.7 Gas and Telecommunications

Gas and telecommunications infrastructure will be provided in accordance with required standards within the LSP area.

3.8 Bush Fire Control

A Fire Management Plan will be prepared at the subdivision stage to ensure compliance with required standards.

3.9 Community Contribution Plan

The Shire's Town Planning Scheme No.7 identifies land within the Boyanup townsite Structure Plan as being subject to Development Contribution Plan (DCP2 – Boyanup). Section 5.11 establishes the definitions, requirements and processes applicable to developing contribution plans.

These plans are to specify:

- The contribution area;
- Infrastructure and administrative items to funded through the plan;
- The method of determining cost contribution; and,
- Priority and timing of infrastructure.

Figure 1A and 1B includes a number of features that need to be resolved through the community contributions plan, including, but not limited to such items as:

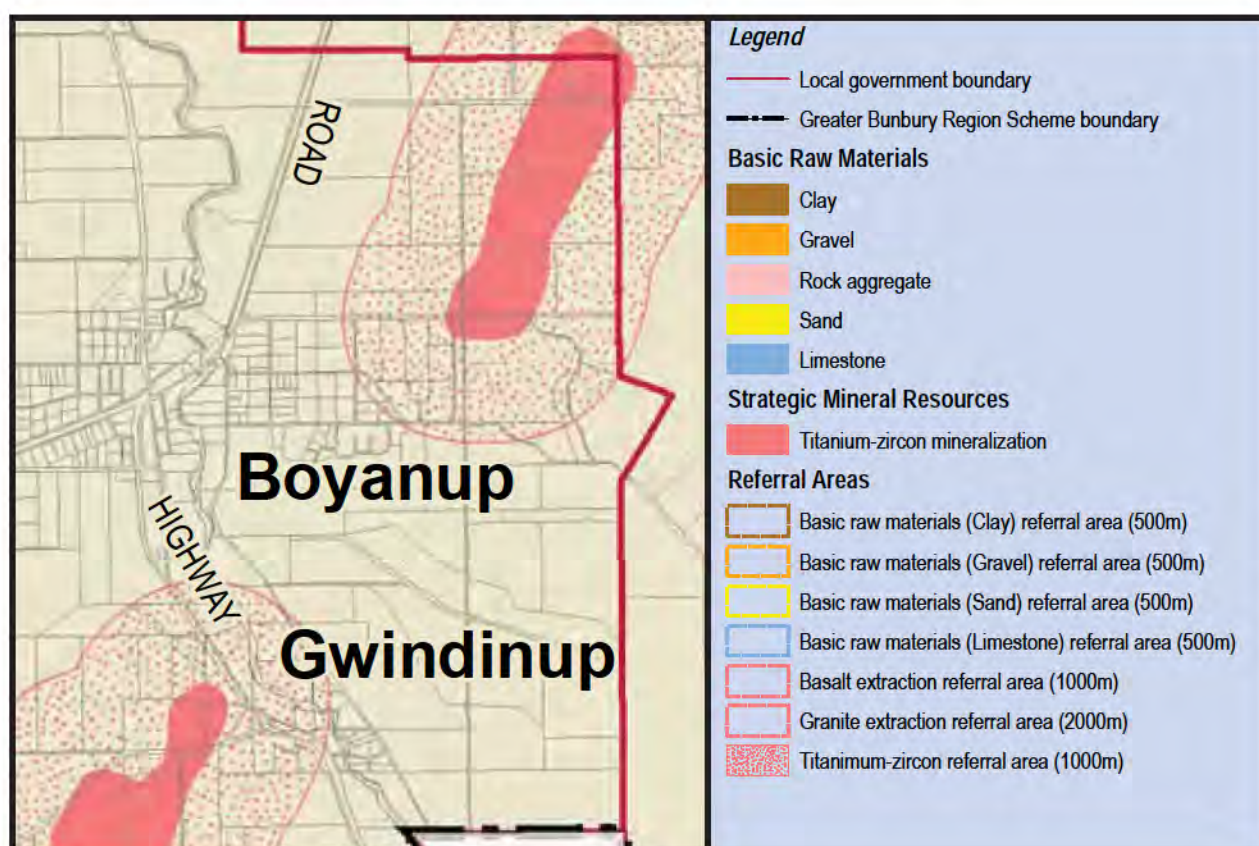
- Contributions towards the creation and development of a community purpose site; and,
- Foreshore Management.

3.10 Resource Notification Area

The Strategic Minerals and Basic Raw Material Policy was adopted pursuant to the Greater Bunbury Region Scheme in 2005. The principal purpose of this policy is to ensure long-term security of access for minerals and basic raw materials and to achieve this through appropriate land use planning and control of development.

A portion of the LSP area is within a 'Titanium-zircon referral area (1,000m)' – refer to plan extract below. The LSP identifies the required referral area from the identified mineralisation pursuant to the published Policy plan and an additional referral area which relates to recently identified mineralisation. Any lots created within 1,000m of the Strategic Mineral Resource will have a notification placed on their titles stating that mining may occur nearby in the future.

The Department of Mines and Petroleum recently identified the new area of mineralisation north of Gray Road which potentially has significant implications for the LSP area in view of a potential 500m separation buffer over existing urban land. This new area was not considered in the GBRS Strategic Minerals and Basic Raw Material Policy or the WAPC endorsed Boyanup Townsite Strategy. It is considered that the extent of the 500m separation area to the new area of mineralisation identified is unreasonable because it is located over existing Residential and Special Rural zoned land. The status of this existing residential area indicates that consideration should be given to accommodating the buffer on-site in the Rural zone (north of Gray Road) rather than off-site on land that is already zoned for residential land use and has been partly developed for that purpose. The referral area is identified on the LSP accordingly."



Extract of GBRS Strategic Minerals and Basic Raw Material Policy Plan

4.0 STATUTORY PLANNING FRAMEWORK

4.1 Greater Bunbury Region Scheme

The Greater Bunbury Region Scheme (GBRS) is the statutory region scheme for the Greater Bunbury area. The key aim of the GBRS is to promote “sustainable development of land taking into account relevant environmental, social and economic factors.”

The GBRS zones the Cotton Holdings land as “Urban Deferred” (see *Figure 15*). The “Urban Deferred” zoning is for land suitable for future urban development subject to more detailed planning and servicing requirements being addressed. The lifting of the “Urban Deferred” zone can be undertaken by resolution of the WAPC. Lots 92 and 93 are zoned ‘urban’.

Confirmation is required as to the process and best method of securing the WAPC’s endorsement to the transfer of the land from ‘Urban Deferred’ to the ‘Urban’ zone.

Land immediately to the east of the land the subject of this report is generally reserved as ‘State Forest’ within the Region Scheme. To the west, land is primarily included within the ‘Urban’ zone while land to the north and south is zoned ‘Rural’.

4.2 Shire of Capel Land Use Strategy

The Shire of Capel Land Use Strategy (April 1999) was prepared following the publication of the Bunbury-Wellington Region Plan. The document seeks to balance the important regional needs with those of the local land owners and residents. It also aims to give clear guidelines for land use and subdivision within the Shire.

For the purposes of the Strategy, the Shire is broken up into numerous planning units. The subject land is included within ‘Planning Unit P3 – Preston – Scarped Plateau’ (see *Figure 16*).

The stated Objective for this unit is:

“To allow for a mix of rural uses and provide for expansion of the Boyanup Townsite and to conserve landscape integrity, especially the Scarp.”

The land is more specifically identified within the Strategy as ‘Settlement Expansion – Residential’.

The major issues affecting the unit are identified as:

- Post mining rehabilitation and land use;
- Control of nutrients entering the Preston River;
- Availability of water in the Preston River for use in horticultural pursuits;
- Protection of good quality agricultural land;
- Expansion of the Boyanup Townsite;
- Request from some land owners for consideration of land for Rural Residential subdivisions;
- Ad hoc subdivision of rural lots; and,
- Bush fire hazard management.

Of relevance to the subject land, the range of 'Desirable Uses' within the unit include:

"Settlement expansion to the east and southeast of Boyanup Townsite in the Joshua Brook valley using a range of subdivision styles, including low density Residential and Rural Residential to retain the rural Townsite character of the settlement."

The range of 'Undesirable Uses' within the unit and relevant to the subject lots include:

- "Clearing remnant vegetation in the Preston River valley."

The requirement for further structure planning and rezoning is required to co-ordinate subdivision and development to ensure, amongst other things, that the land is appropriately connected to the local and district road network and other relevant public utilities.

In addition, it is understood that the land which has been the subject of mining for heavy mineral sands on the eastern side of the town site will require additional detailed investigation if it is to be the subject of any development proposals to ensure that post mining rehabilitation can achieve suitable soil conditions.

4.3 Shire of Capel Town Planning Scheme No. 7

The subject land is situated within the municipality of the Shire of Capel. The land is therefore subject to the provisions of Shire of Capel Town Planning Scheme No. 7 (TPS 7) and is currently predominantly zoned 'Special Rural', with the exception of Lot 9003 which is currently zoned 'Rural' and Lots 92 and 93 which are zoned "Residential R10/15" (see *Figure 17*).

In accordance with its TPS 7, Council's objective in making provision for a Special Rural Zone is to identify land within the Scheme Area which is suitable for closer subdivision to provide for such uses as hobby farms, rural-residential retreats, intensive agriculture including market gardens and viticulture, in such a manner as to make provision for retention of the rural landscape and amenity in a manner consistent with the orderly and proper planning of such areas.

In addition to any provisions which are more generally applicable to land zoned Special Rural, Appendix 16 of TPS 7 sets out the current specific provisions for controlling land uses and development relating to particular Special Rural Zone Areas.

The subject land is included within Area No. 5 of Appendix 16 of TPS 7.

Rezoning of the land under TPS 7 is required to ensure consistency with the intent of the "Urban Deferred" zoning under the GBRS. The "Urban Development" zone is the most appropriate vehicle to drive the regional vision for the locality.

In accordance with TPS 7, the objective of the 'Urban Development' zone is stated as:

"The Urban Development Zone is an interim zoning for land. Council's objective is to provide for future urban development after comprehensive planning by means of preparation of an outline development plan. It is intended that land in this zone shall be progressively developed for residential purposes and for commercial, community and other uses normally associated with residential estates. The zone is designed to be flexible in nature so as to overcome the inherent problems associated with detailed zoning of land prior to lot boundaries being established by subdivision."

4.4 Boyanup Townsite Strategy

The endorsed Boyanup Townsite Strategy has the vision:

“To promote and facilitate the growth of the Boyanup townsite as a sustainable and vibrant rural town that is a significant settlement and service centre within the Shire of Capel.”

This vision is supported by a raft of aims and objectives, strategies and actions.

In addition, a Boyanup Townsite Structure Plan has been prepared to provide a district level overview on future staging and settlement patterns (see *Figure 18*).

The area identified in 5A under the designations of ST 1 and LT 2 have an estimated lot yield of 660. The areas identified in as ST/MT 3 and ST 3 have an estimated yield of 800. It is noted that ST/MT 3 straddles both Precincts 5A and 5B.

The East Boyanup LSP generally matches these yields as shown in *Figure 28*.

The timing and actual yield may vary and be reduced as it is dependent on the aspirations of a significant number of small landowners and other constraints resulting from the location of existing dwellings.

Figure 19 demonstrates compliance with the intent of the main policy statements of the Boyanup Townsite Strategy Map. Further, *Appendix 9* provides an audit that demonstrates compliance with the Boyanup Townsite Strategy.

4.5 Joshua Brook Structure Plan

The Joshua Brook Structure Plan was adopted by the Shire of Capel in February 1997 (see *Figure 20*). This structure plan identified the creation of a special rural style of development east of the central POS/ drainage corridor that bisected East Boyanup. The Boyanup Townsite Strategy has refined the settlement pattern vision for East Boyanup to enable higher density development to be considered east of the POS/ drainage corridor.

4.6 Boyanup Public Open Space Strategy

This strategy is to guide the provision of POS within Boyanup. It provides a basis for the improvement of the quality and diversity of parks and the delivery of improved recreation services to ensure sustainable use of the Shire’s resources.

The strategy includes a Boyanup Public Open Space Strategy map (see *Figure 21*) which identifies an open space hierarchy and indicative spatial distribution.

The East Boyanup LSP reflects the intent of this draft strategy through the incorporation of the following elements:

- Identification of a central active recreation area combined with a primary school site;
- Inclusion of a district level open space corridor that bisects East Boyanup;
- Identification of neighbourhood parks in central locations to the intended walkable catchments; and,
- Identification of potential sites for local parks along multiple use corridors.

4.7 Urban Landscape Strategy

This strategy has the intent to address urban townscape, amenity, environment and management considerations within the Shire's town sites. The principle aim of the strategy is to:

"Enhance amenity, environmental, sustainability and cultural outcomes in relation to the landscaping of public spaces and development sites in urban areas".

This principal aim is to be achieved through:

- Retain existing native vegetation for its environmental, landscape amenity and cultural heritage values;
- Use indigenous species in the landscape to reflect a sense of place and enhance ecological outcomes;
- Encourage best practice in relation to sustainability, landscape design and species selection;
- Provide for the needs of the community by ensuring that public spaces are functional, accessible and safe for the intended purpose;
- Encourage the use of landscaping outcomes that reinforce public health, social interaction, cultural heritage and Shire character; and,
- Provide guidelines for the sustainable landscaping and maintenance of public spaces and development sites.

Section 2.5 of the strategy outlines the need for a Landscape Master Plan to be submitted as part of the structure plan process for major Greenfield subdivisions of urban land. This plan is to address and include:

- Existing site information;
- Proposed site elements (parks, playgrounds, ovals, gardens, structures, buildings, roadways, car parks, bike trails and footpaths);
- Initiatives for the retention of existing vegetation;
- Areas to be landscaped and their proposed treatment;
- Broad planting design; and,
- An overlay plan of street trees.

Section 5.7 of this report contains a Landscape Master Plan. Further refinement of landscape plans will be prepared and implemented at the subdivision stage.

4.8 Liveable Neighbourhoods (LN)

Liveable Neighbourhoods (LN) is a WAPC operational policy for the design and assessment of subdivisions and structure plans. The latest version of LN was released by the WAPC in January 2009. It addresses both strategic and operational aspects of structure planning and subdivision development in a code framework.

The principal aims of the Liveable Neighbourhoods are to:

- Provide for an urban structure of walkable neighbourhoods clustered to form towns to reduce car dependence;
- Ensure walkable neighbourhoods and access to services and facilities;
- Foster a sense of community;
- Provide an interconnected network of streets for safe, efficient and pleasant walking, cycling and driving;
- Ensure active street frontages;
- Facilitate mixed use urban development to provide a wide range of living, employment and leisure opportunities;
- Provide a variety of lot sizes and housing types;
- Provide an integrated approach to the design of open space and urban water management; and,
- To maximize land use efficiency.

Appendix 1 demonstrates compliance with Liveable Neighbourhoods requirements and includes a table as well as plans including ped shed and solar access analysis.

5.0 CONCEPT DEVELOPMENT

5.1 East Boyanup Design Concept

5.1.1 The Vision

To embrace, explore and achieve:

- A sense of place;
- A legible movement system that promotes safe and attractive cycle and pedestrian environments;
- A public realm that encourages community spirit, is safe and promotes healthy lifestyles; and,
- An urban form that promotes attractive neighbourhoods that carry a village style aesthetic.

5.1.2 Design Objectives

The philosophy of design embraces the following objectives:

- To create precincts that project individual character and provide a wide range of lifestyle options;
- To protect remnant vegetation;
- To identify community focal points and points of interest within neighbourhoods providing a variety of lifestyle opportunities and helping to promote growth of a well balanced community;
- To incorporate state of the art water sensitive design solutions;
- Maximise opportunities for passive solar orientation; and,
- To create sustainable open space environments, focusing on native plant selections and using local materials and sensitive water design and use principles to inspire inspirations the establishment of a unique and attractive setting for urban development.

To achieve these objectives, eight neighbourhood precincts have been designed to acknowledge specific site attributes, existing development and linkages with the wider Boyanup townsite and river setting (see *Figure 2*).

These neighbourhoods are to create a sense of individual identity and a range of housing and lifestyle options that maximise opportunities to draw together a new community that has strong ties and positive relationships with the existing Boyanup Townsite, river and natural environment.

5.2 Exploring Opportunities and Constraints

Figure 22 shows the principal opportunities and constraints of the East Boyanup LSP area and surrounds. These are summarised as follows:

Constraints

- Limited crossing points to external road network;
- Separation from Boyanup Townsite by the Preston River alignment;
- Fragmented landownership and location of existing buildings and improvements throughout the LSP area;
- Significant areas of land being subject to previous mining and extraction activities;
- Existence of Council waste disposal site within the north eastern corner of site;
- Existence of State Forest on the eastern boundary presenting a fire risk;
- Location of agricultural land to the northern and southern eastern edges; and,
- Location of existing special residential development within the southern edge of the LSP area.

Opportunities

- Rehabilitation and beautification of the Preston River foreshore environment;
- Opportunity to create a pedestrian linkage across the Preston River to connect to the Boyanup Primary School and community playing fields and facilities;
- Retain attractive street trees along Stephen Street;
- Opportunities to retain remnant vegetation within larger lots and open space corridors;
- To beautify and incorporate the existing mining voids into the POS/drainage network; and,
- To create an East Boyanup village centre in a well connected and convenient location that is at the cross roads of the linear open space network.

Exploring the Conceptual Design

The driving principle of the concept is to create a number of clearly defined and distinctive neighbourhoods defined by, and connected by, an attractive local open space network (see *Figures 1 and 2*).

The design seeks to sensitively tread around existing low density development and areas of vegetation by providing transitional areas that graduate outwards towards more traditional urban township development. Each precinct that embodies a more traditional residential flavour includes at least one central focal point or open space environment that links into the wider design.

The following sections describe the core elements, goals and initiatives to achieve the vision for the East Boyanup LSP.

5.3 Natural Framework

Figure 23 provides details of the local character, highlighting natural attributes and values.

Existing Context

- Remnant vegetation needs to be retained and linkages established and enhanced through recreational corridors;
- The Preston River foreshore environment needs to be suitably rehabilitated and public and private realms easily identified and defined; and,
- Provide a transitional area between state forest and rural interfaces.

Goals

- To protect and rehabilitate the Preston River environment;
- To create open space linkages; and,
- To promote native plantings in public and private spaces to enhance local character and define a sense of place.

5.4 Open Space and Recreation Framework

Figure 24 displays how open space and recreational areas will engage with and define neighbourhoods and the urban form.

Goals

To create an integrated open space framework by:

- Providing a comprehensive series of walkways and cycle ways, integrated into the open space network;
- Providing a centralised active open space area in conjunction with a local primary school site;
- Providing a system of accessible, safe and well located parks that satisfy a hierarchy of recreational and community needs;
- To promote a sustainable landscape utilising native species, limiting grassed areas, incorporating sensitive water design features and water capture and reuse; and,
- Creating a sense of place through location of open space to create focal points, visual anchor points to vistas and provide attractive tree lines and view corridors.

5.5 Movement and Transport Framework

Figure 25 provides a journey through the movement and transport framework.

Existing Context

- Two existing access points connecting to wider regional road network; and,
- Locality serviced by a number of existing roads at various standards of construction.

Goals

- To provide safe and convenient access to the wider regional road network;
- To provide high levels of pedestrian access through open space networks;
- To provide a pedestrian crossing bridge to Boyanup in proximity to the existing school and community sporting facilities;
- To create a strong north south road network to assist in maximising solar access potential for future residents; and,
- To retain the tree lined character of Stephen Street.

The Road hierarchy established in the structure plan reflects the principles of Liveable Neighbourhoods. Focal points are linked to provide a strong legible primary road network.

Within this network a modified grid of roads has been created to further enhance connectivity. As far as possible the alignment of roads are predominantly north south to maximise the solar orientation of houses. Where possible, access streets give direct access to areas of public open space. Further the design aims to give residents a park at the end of their street.

Road reserve, cross section treatments and pavement widths will be provided in accordance with Liveable Neighbourhoods.

The pedestrian movement network will be developed in accordance with Liveable Neighbourhood requirements. The network will consist of a number of strategic path linkages providing direct connections to the central open space, the Boyanup townscape and river environments. This strategic network will consist of a dual use path network.

This network will be located within linear open space, multiple use corridors and local road reserves. Emphasis will be provided in providing a high quality pedestrian and cyclist amenity, with emphasis on passive surveillance and minimising cyclist/vehicular conflicts. The use of open space corridors provides scope for passive surveillance while eliminating conflicts from vehicular crossovers. This will improve the safety and utility of the network. Footpaths will be provided in accordance with Liveable Neighbourhood requirements.

Figure 25 provides direction on the staged implementation of the road network as it progresses towards alternate developments. The increment of development of the road network will be guided by a traffic study that identifies specific trigger points for each element to be implemented.

A shared path and pedestrian path plan will be developed to provide for connectivity to the existing Boyanup path network and to determine the timing and construction of a pedestrian bridge over the Preston River.

5.6 Sustainability Outcomes

Sustainability initiatives will be implemented in more detailed planning and design stages.

The LSP plan provides a sound basis for the achievement of broad sustainability outcomes in the following ways:

- Providing a multi functional and highly accessible local centre that combines a school, community site, commercial activity and open space network;
- Providing scope for medium density housing within walkable catchments of open space and community facilities;
- Establishing a highly permeable footpath and cycleway networks to encourage fitness and reduce dependence on private cars;
- Establishing water-wise landscaping treatments and water sensitive water design solutions;
- Encouraging the use of native species in open space environments and front verges; and,
- Establishing a road network that promotes the achievement of passive solar design for buildings.

A Sustainability Strategy is provided at *Figure 30*. Sustainability outcomes and implementation plans will be required at the subdivision stage to ensure these principles and other finer grained initiatives are undertaken and achieved.

5.7 Precinct Visions

Appendix 2 provides a short pictorial vision for each of the following precincts.

5.7.1 Preston River Village Precinct

To create a traditional grid pattern of urban development that builds on the existing road alignments and their street tree setting. The heart of the precinct is to be enlivened by a vegetated path network connecting to the adjoining precincts. A large neighbourhood park forms a key focal point and a central heart for recreational activity.

The road network will be characterised by a modified grid format to reflect a traditional townsite character. Character will be further enhanced through the provision of medium density housing options around focal points.

The built form will project an urban townsite setting through use of minimal setbacks, use of rear laneways, use of low open front fencing and architectural features that encourage activity in the front, such as verandas and porches.

The heart of the precinct has opportunity to incorporate a vegetated path network linking the precinct to the East Boyanup Village precinct. The linear open space will provide opportunity for native tree planting and establishment of a bush foods corridor providing a high amenity shaded pedestrian and cycle environment and help establish a distinctive high amenity urban setting.

5.7.2 Riverside Living Precinct

To create a living environment that embraces access and outlooks to the Preston River foreshore. The design focuses on providing a local park that provides a central point for a local road network to open up vistas and access to the foreshore environment. A road and path network is proposed to provide a clear interface along the foreshore environs. A mix of density is proposed to acknowledge existing development and topography.

The area between Hurst Road and the River is partly zoned Rural pursuant to the GBRS. This area is subject to further investigation and more detailed planning before development can occur and the zoning in the GBRS amended to Urban due to a number of identified constraints e.g. long term development staging, rural residential land use, foreshore protection area, ecological linkages.

5.7.3 Ranch Living Precinct

To create a pleasant bush setting in which houses can nestle discreetly. Impacts on remnant vegetation are to be minimized through careful selection of building envelopes and use of low open style fencing along boundaries. A minimum lot size of 2000m² will enable retention of a bush setting.

5.7.4 Parkside Living Precinct

To create a free flowing residential environment that leads to open space vistas.

The open space should retain existing vegetation corridors to provide attractive bush outlooks.

To create a pleasant residential environment that focuses onto a central open space corridor that retains existing vegetation and provides opportunity to enhance links to the river and central open space corridor.

The road alignments are to step away from tight liner alignments to add interest and provide a more organic flavour to the residential setting. The edges of the precinct are to be defined by open space which will provide attractive tree lines and provide opportunity for sustainable ecological functions to prosper.

5.7.5 East Boyanup Village Precinct

To create an attractive local centre that incorporates commercial, civic and recreational uses within a traditional main street setting. The centre is to be highly integrated into the wider locality through a strong open space and road network.

A local primary school will abut the southern side of the main street and provide opportunity to develop a local oval for shared use in the community.

5.7.6 Woodland Living Precinct

To create a low density lifestyle precinct that acknowledges the environmental values of the site and the scale and setting of existing development to the south (Duce Drive precinct). A variety of lot sizes are proposed, ranging from 2,000m² to over 5,000m².

The subdivision layout and road alignments seek to minimise disturbance to vegetation, some of which is identified as regionally significant vegetation which should be protected. As the vegetation also creates a potential fire hazard, the Office of the Environmental Protection Authority sought changes to the earlier subdivision design and a balance was reached in relation to the lot yield within the area and the requirement for clearing as a result of future development and fire management requirements.

Specifically, the lot yield was reduced and bush fire management design issues were considered in terms of:

- Planning for Bush Fire Protection Guidelines
- draft Planning for Bushfire Risk Management Guidelines 2014
- AS3959 Construction of Buildings in Bushfire Prone Areas
- Shire of Capel Bush Fire Order.

In relation to Lot 66 Smedley Place, the standard 100m setback from forest vegetation can be reduced by requiring building construction in accordance with BAL29 pursuant to AS3959 and the BCA (which requires extensive fire hazard reduction design and construction of dwellings). A minimum 20m fire safety setback will therefore be applied and, assuming that a dwelling might be located on the edge of a building setback area (envelope), the setback will need to be increased to either 21m or 27m depending on the direction of the slope. Non-habitable structures may be conditionally located within the (BPZ) low fuel zone in accordance with the Planning for Bush Fire Protection Guidelines.

It should be noted that the Scheme Amendment 52 provisions require a detailed Fire Management Plan to be prepared prior to subdivision. This will seek to address and manage ongoing fire hazard management as well the protection of regionally significant vegetation in the precinct. Planning policy statement 12 on the Structure Plan requires appropriate building setbacks are to be identified on vegetated lots at subdivision in order to maximise the protection of remnant vegetation.

5.7.7 Boyanup Hills Precinct

To create a pleasant residential setting with strong north south road alignments that direct views and vistas into open space corridors and parks.

A mix of densities is proposed to provide a range of lifestyle options, including limited medium density housing in strategically identified locations.

5.7.8 Woodland Hills Precinct

To create a low density lifestyle precinct that enables retention of existing vegetation and provides a transitional zone to agricultural activity to the east.

The precinct will include a mix of lots ranging from 2000m² to over 5000m².

5.8 Open Space Network Visions

The open space philosophy is driven on two complementary forces. These are to create points of interest within neighbourhoods and to use plants and themes to promote harmony with the natural settings and seasonal cycles.

The use of local species will provide a unique natural setting for urban development. To further emphasize local context and develop a natural setting, verges and front setback areas of private lots will be landscaped utilizing water wise garden principles and native species.

This approach seeks to create local flavour, creating a sense of identity and uniqueness while reducing ecological footprints. *Appendix 3* provides a pictorial vision for the various open space environments.

5.8.1 Distribution of Local Open Space Areas

The location of Public Open Space areas has been guided by the need to provide highly accessible useable recreational areas, protect stands of trees, remnant vegetation and provide opportunities for multiple use corridors (see *Figure 27*). The Public Open Space network consists of a large centrally located open corridor that runs north south. This provides a central frame in which other open space and access networks can hang and connect to.

This central park is connected to the wider structure plan via a number of vegetated multiple use corridors and vegetated paths abutting road reserves. In addition, opportunities exist to create pocket parks along open space corridors to provide attractive focal points for precincts.

A Public Open Space audit will be provided on a stage by stage basis to provide accountability and demonstration that Public Open Space will be provided in an orderly and proper manner. This Public Open Space audit will be updated on a stage by stage basis as more detailed design work is finalised.

The provision of Public Open Space has been driven by both active recreational needs and environmental and drainage requirements as well as creating unique focal points and identity for precincts. A vision for Public Open Space treatments is explained in the following section.

5.8.2 Design and Function of Open Space Areas

Linear Park

The intent of these parks is to provide an attractive shaded open space path network connecting to the proposed East Boyanup Village Precinct. Plantings are to include “bush food” species to provide a unique and functional aspect to the landscape.

The width of the park provides opportunities for pockets for local parks that may accommodate small seating/rest areas and/or play ground/fitness equipment.

Multiple Use Corridors

The intent of these areas is to combine opportunities for water sensitive water design and high quality landscape settings and frames for residential neighbourhoods. The corridors include opportunities to retain existing remnant vegetation, provide attractive shaded path networks, open aspects and pockets for play grounds and small rest/picnic areas.

Neighbourhood Parks

The intent of these parks is to provide a traditional focal points framed by a tight residential setting. The parks are to provide opportunities for informal recreational activity.

Local Parks

Local parks are intended to provide small pockets within linear and multiple use corridors as well as strategically located attractive focal points with the intent to provide informal play and a range of low key passive recreational activities.

Central District Open Space

This open space has opportunities to accommodate a wide range of functions, including an active open space oval integrated with the local primary school, community facilities and passive recreational areas around the artificial lake systems. This space will also include opportunities for an extensive path network to link the precinct together and provide an attractive area for exercise.

Foreshore and Conservation Areas

This open space has the primary function of protecting and enhancing remnant vegetation that has environmental value. These areas also provide opportunities to accommodate controlled access paths and small pocket parks for passive recreational activities.

5.8.3 Landscape Master Planning

To ensure that the vision for the open space network is fully achieved, a Landscape Master Plan has been prepared to provide a comprehensive and clear vision (see *Figure 28*).

5.8.3.1 Landscape Master Plan Vision

To create attractive, sustainable streetscapes and public environments that promotes the establishment of a local identity, community pride and legibility.

5.8.3.2 Landscape Master Plan Objectives

Open Space

- To create easily identifiable open space environments within the urban environment;
- Incorporate and promote low maintenance management and sustainability through careful selection of local native species and sensitive water management and design;
- Emphasise site lines and vistas through the specific plantings to improve legibility and create attractive focal points and vistas, outlooks;
- To create attractive shaded pedestrian path networks within multiple use and open space corridors; and,
- To create bush food corridors that connect the Boyanup Village precinct to achieve a harmonious marriage of functional and aesthetic values and promote positive community awareness of nature.

Streetscapes

- To create streetscapes that creates flavours of a rural village through selection of native street trees and low shrubs and groundcovers;
- To unify identification through use of Peppermint trees for residential environments;
- To create easily identifiable precincts through selections of selections of low shrubs and groundcovers;
- To emphasise the importance of the Boyanup Village Main Street through plantings of Macadamia trees; and,
- To promote native species plantings within front setback areas and prohibit use of grassed areas in road verges.

The Landscape Master Plan is depicted in *Figure 27*. It depicts the principles and themes of precincts, open space environments and a sample of species selections to be considered in more detail when preparing future detailed landscape plans.

6.0 IMPLEMENTATION AND STATISTICS FRAMEWORK

6.1 Structure Plan Statistics

Figure 28 outlines the Structure Plan Statistics and reference plan for public open space areas. It also demonstrates that public open space provision complies with Liveable Neighbourhood requirements. Part 1 of this report details the future mechanisms required for individual landowners to provide and construct public open space.

6.2 Staging and Timing of Development

The aspirations of small landowners are unknown. However, an indicative staging plan has been prepared to highlight the larger landowner intentions (in particular Cotton Holdings).

Figure 29 represents a staging plan and will ensure the release of land occurs in a manner generally consistent with the intent of the Boyanup Townsite Strategy.

6.3 Scheme Amendment Proposals

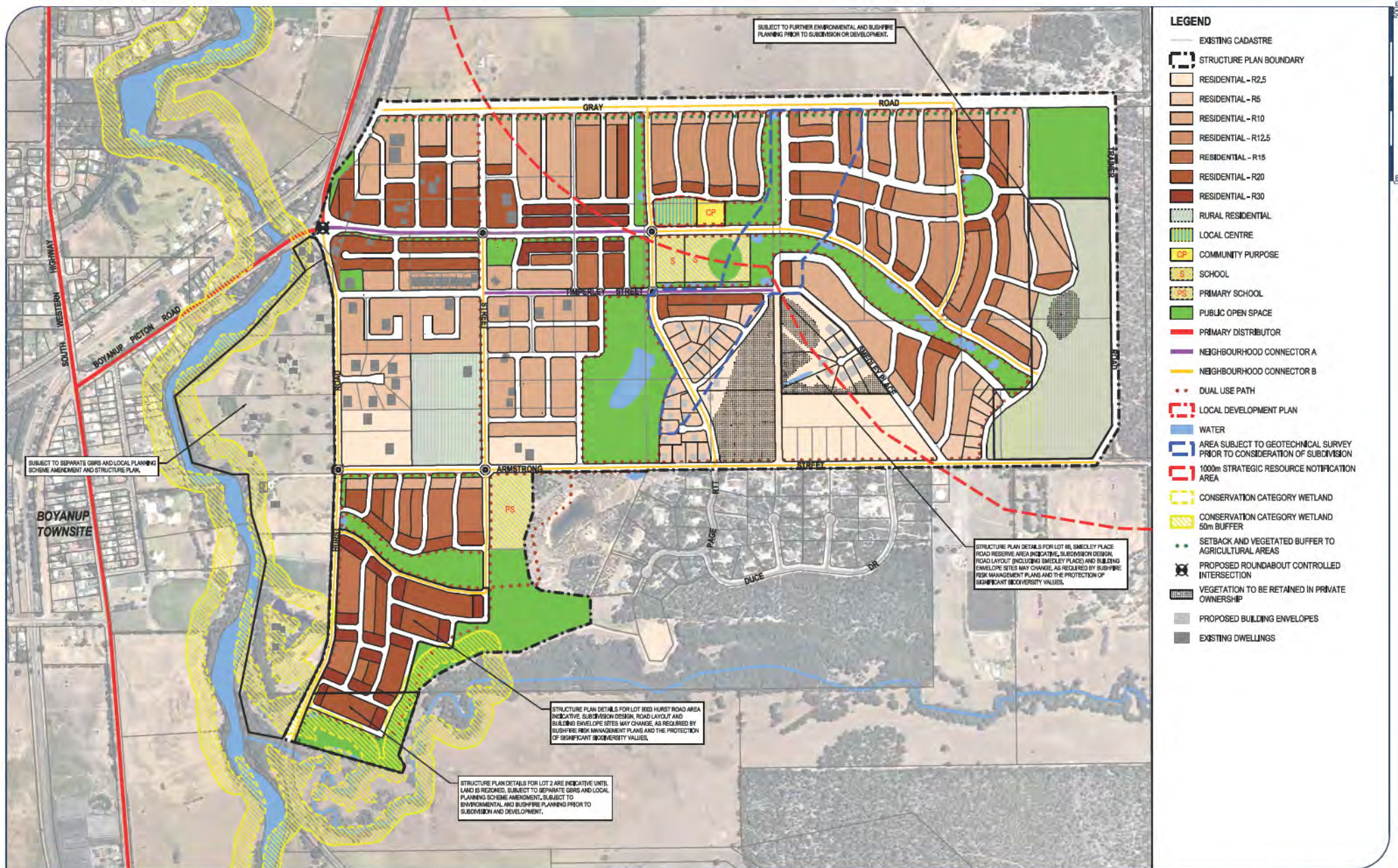
The subject land will require rezoning under the Shire's Town Planning Scheme No. 7. It is recommended that a "Development Zone" amendment be initiated to facilitate development for urban purposes. This zoning will enable future subdivision and development to occur in accordance with the East Boyanup LSP.

The area between Hurst Road and Preston River is partly zoned Rural pursuant to the GBRS and will require further investigation and more detailed planning before the zoning in the GBRS and Town Planning Scheme No. 7 can be amended to 'Urban' and 'Urban Development' respectively.

6.4 More Detailed Plans and Strategies

The East Boyanup LSP sets out the broad framework for the future subdivision and development of East Boyanup. More detailed plans and strategies will be required to ensure the successful implementation of this plan.

FIGURES





Boyanup East Local Structure Plan

Implementation : Subdivision and Development Requirements

1. This structure plan provides a basis for zoning (including residential density) and subdivision of land and will be given due regard when determining applications within the structure plan area, including consideration of the objective and requirements of the scheme zones proposed by the structure plan.
2. Subdivision and development shall be generally in accordance with this Local Structure Plan, Appendix 16 of Town Planning Scheme No. 7, any associated local development plans, landscape plans and design guidelines, Liveable Neighbourhoods and the Residential Design Codes.
3. Subdividers will be required to make adequate contributions towards community facilities consistent with the development contributions plan, as articulated by a scheme amendment to the local planning scheme.
4. Prior to the approval of subdivision or development, the Shire may require the preparation and adoption of 'design guidelines' for specific development proposals - the guidelines will be required to promote themes which relate to Boyanup.
5. Prior to the approval of any subdivision the subdivider is to submit for approval by the Shire a detailed staging plan and mechanisms to achieve:
 - the coordination of landowner responsibilities in relation to servicing arrangements,
 - the construction and/or upgrading and timing of servicing infrastructure, including the main roundabout and other road infrastructure, and any required land acquisition,
 - provision of the school site, community purposes site and local centre
 - provision of any sports ovals and/or playing fields
 - provision/construction of shared paths, pedestrian paths and pedestrian bridge,
 - the provision and development of POS,
 - contributions to community facilities.
6. Prior to the approval of subdivision a 'shared path and pedestrian path plan' shall be prepared by the subdivider which provides for connectivity to the existing network in the locality including to community focal nodes in the Boyanup town centre and the timing and funding of the construction of the pedestrian bridge over the Preston River - footpaths are to be provided within all road reserves in accordance with 'Liveable Neighbourhoods' and relevant Shire requirements,
7. Prior to the approval of subdivision the subdivider shall submit foreshore management plans for foreshore areas which address:
 - a. environmental values,
 - b. risk management (flood, fire etc),
 - c. mosquito habitat management,
 - d. ongoing sustainability and reserve management mechanisms,
 - e. implementation responsibilities,
 - f. vesting/management arrangements,
 - g. development restrictions in wetland buffer areas.
8. Prior to the approval of subdivision detailed landscape plans for POS, drainage areas and road reserves shall be prepared by the subdivider having regard to:
 - a. Shire of Capel Urban Landscape Strategy,
 - b. East Boyanup Landscape Master Plan,
 - c. Boyanup Public Open Space Strategy,
 - d. application of waterwise landscaping principles and species selection,
 - e. Shire standards for stormwater detention in POS and multiple use corridors,
 - f. provision of adequate car parking, pathways, park furniture, recreation facilities and playgrounds in POS,
 - g. identification of adequate vegetated buffers at the interface of residential expansion and the surrounding rural areas,
 - h. subdivider responsibilities for implementation and management of landscaping, and
 - i. ongoing sustainable maintenance.
9. Prior to subdivision a Detailed Fire Management Plan is to be prepared for the subject land which also addresses surrounding areas where bushfire hazards are evident that could impact the subject land.
10. Prior to development of the local centre site a local development plan shall be prepared for the site having regard to the relevant requirements of Town Planning Scheme No. 7 - the plan shall include detailed urban design standards/guidelines for matters including floor space, building design, building height/bulk, finishes, traffic and pedestrian management, car parking, landscaping, street furniture, pavement treatments, control of advertising signs and the intended staging and timing of development.
11. The mosquito management plan shall:
 - a. reference to the need for Water Sensitive Urban Design to use the Department of Health's risk assessment guide re: mosquito breeding and prevention of mosquito breeding areas, and
 - b. include advice on mosquito management from the Department of Health in Wetland Management Plans and Urban Water Management Plans e.g. 'Chironomid Midge & Mosquito Risk Assessment Guide to Constructed Wetlands'.
12. Subdividers shall ensure that the alignment of roads and streets is designed to minimise disturbance to vegetation and that mechanisms are in place for the protection of remnant vegetation during subdivision works.
13. Subdividers shall establish a mechanism e.g. management plans, to ensure that dust and noise creation from subdivision works is adequately managed to prevent nuisance to nearby residents during construction.
14. Subdivision design and development of Lots 116 and 117 shall not result in the imposition of management obligations on the adjoining State Forest. Subdivision design, lot layout and building envelopes in these areas are to be informed by a bushfire Management Plan and protection of significant biodiversity values.



Calibre Consulting (Aust) Pty Ltd
Unit 5, 53 Victoria Street
Bunbury WA 6230
Ph 08 9791 4411
www.calibreconsulting.co

Copyright This document is and shall remain the property of Calibre Consulting (Aust) Pty Ltd.

BOYANUP EAST LOCAL STRUCTURE PLAN

Shire of Capel, Sheet two of two

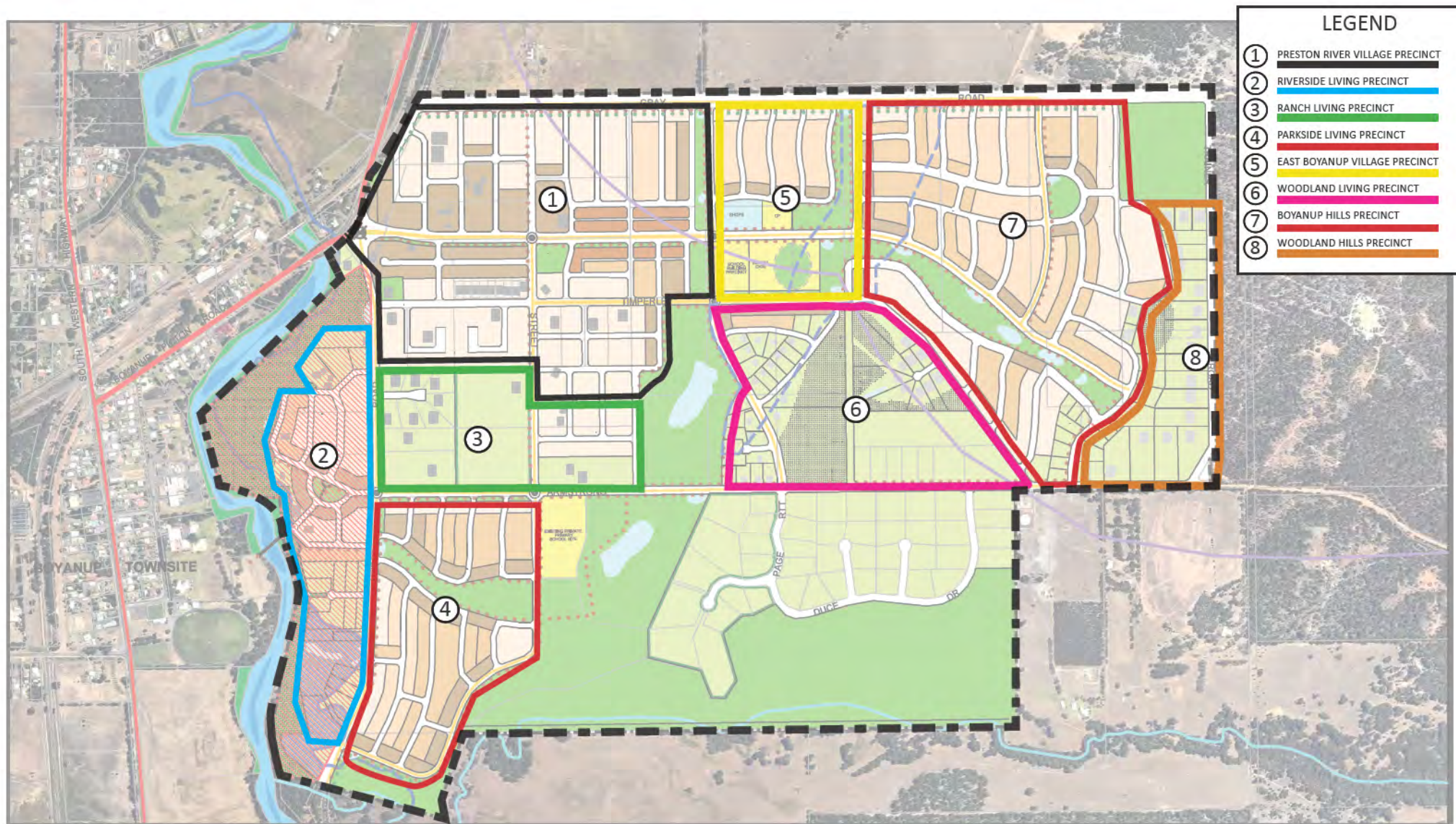


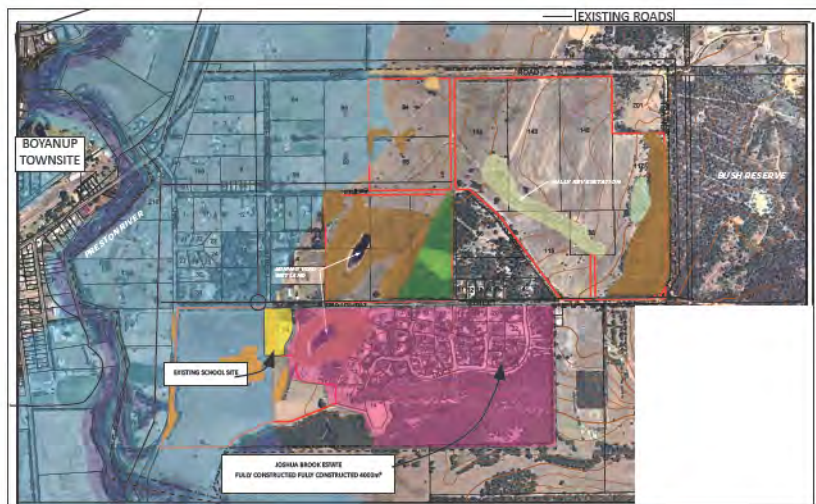
Plan No: 15108P-SP-02

Date:	28/01/2018
Rev:	ORIGINAL
Scale:	A1 @ 1:1000, A3 @ 1:2000
Co-ords:	MGA
Attrib:	N/A

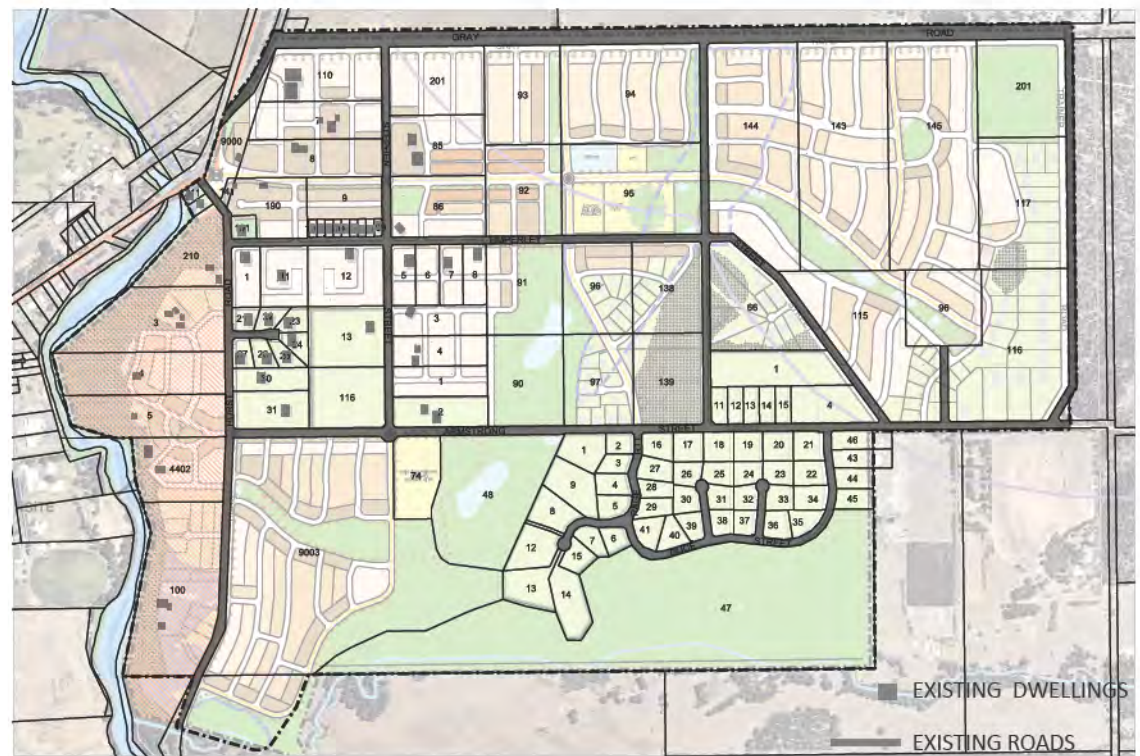
This plan has been prepared by planning proposals, areas, contours and dimensions shown are subject to survey.

Figure 1B Planning Policy Statements





LEGEND	
	SURVEYED VEGETATION UNIT A : KINGIA COMPLEX
	SURVEYED VEGETATION UNIT B : CARTIS COMPLEX
	SURVEYED VEGETATION UNIT C : KINGIA COMPLEX
	SURVEYED POST-MINING REHABILITATION : N/A
	SURVEYED PADDOCK TREES OF CORYMBIA CALOPHYLLA IN OPEN PADDOCK : N/A
	SURVEYED PADDOCK TREES OF EUCALYPTUS MARGINATA, CORYMBIA CALOPHYLLA AND XYLOMELUM OCCIDENTALE : N/A
	GULLY REVEGETATION
	CONSERVATION WETLAND
	MULTIPLE USE WETLAND
	SUBJECT LAND



TOTAL	147.1172

Land Ownership Details (excluding Cotton Holdings)

PLAT

CITY OF ST. LOUIS, MISSOURI

94

95

96

134

136

144

143

145

201

117

115

98

116

STREET

30

1

11 12 13 14 15

4

STREET

16 17 18 19 20 21

40

43

44

45

22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47

DUCE

STREET

Holdings)

This is a detailed plat map of a portion of the City of St. Louis, Missouri. The map shows a grid of lots and blocks, with some areas shaded in orange. The streets shown include GRAY, BEAD, and BEAD. The lots are numbered, and some are shaded in orange. The map also shows a river and a bridge.

Key features include:

- Streets:** GRAY, BEAD, BEAD.
- Shaded Areas:** Several lots and blocks are shaded in orange, including a large area in the upper right and a large area in the lower left.
- Lot Numbers:** Various lot numbers are visible, such as 110, 201, 93, 94, 144, 125, 145, 201, 199, 115, 99, 110, 1, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 79

Land Ownership Plan - Cotton Holdings

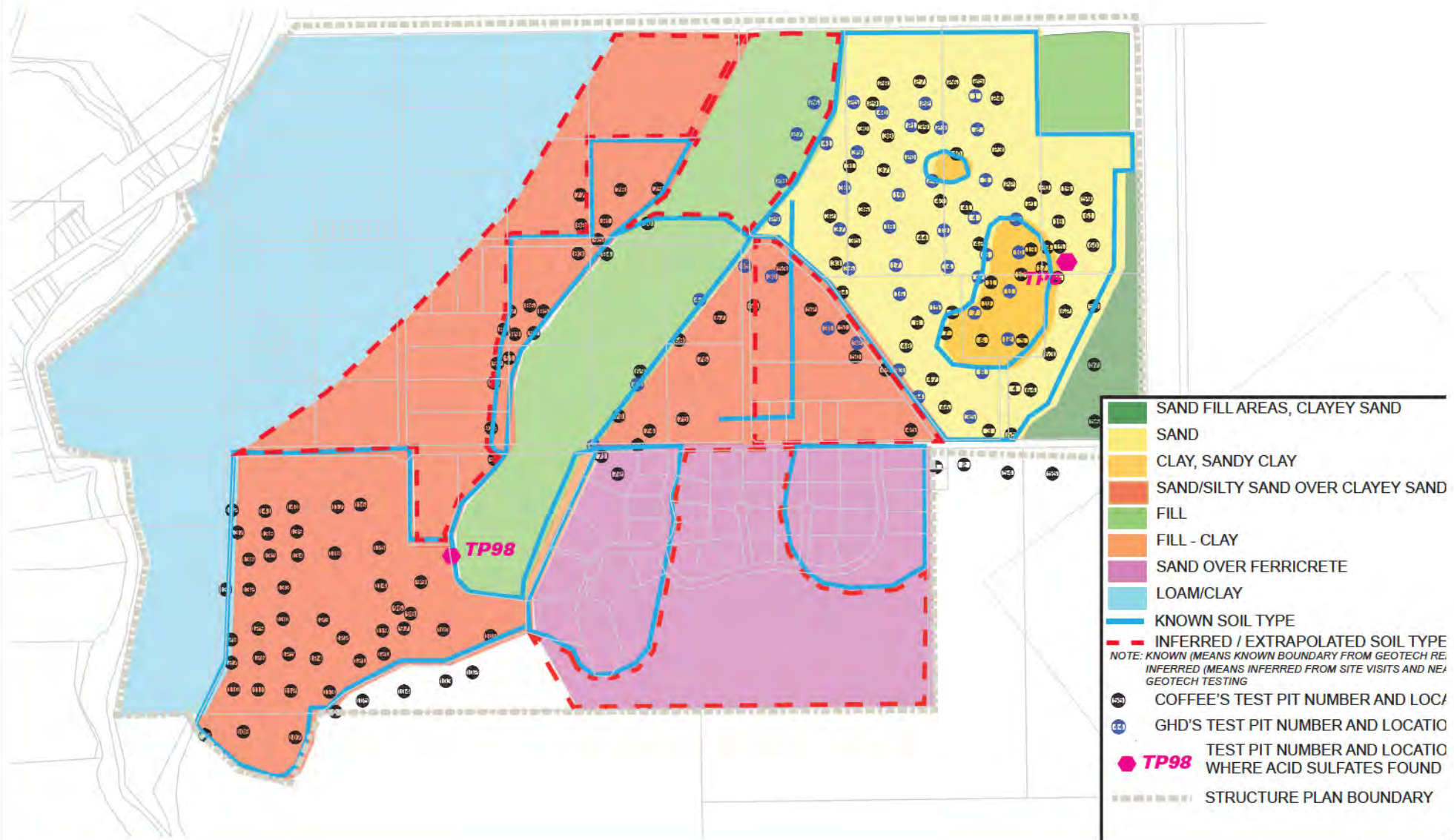
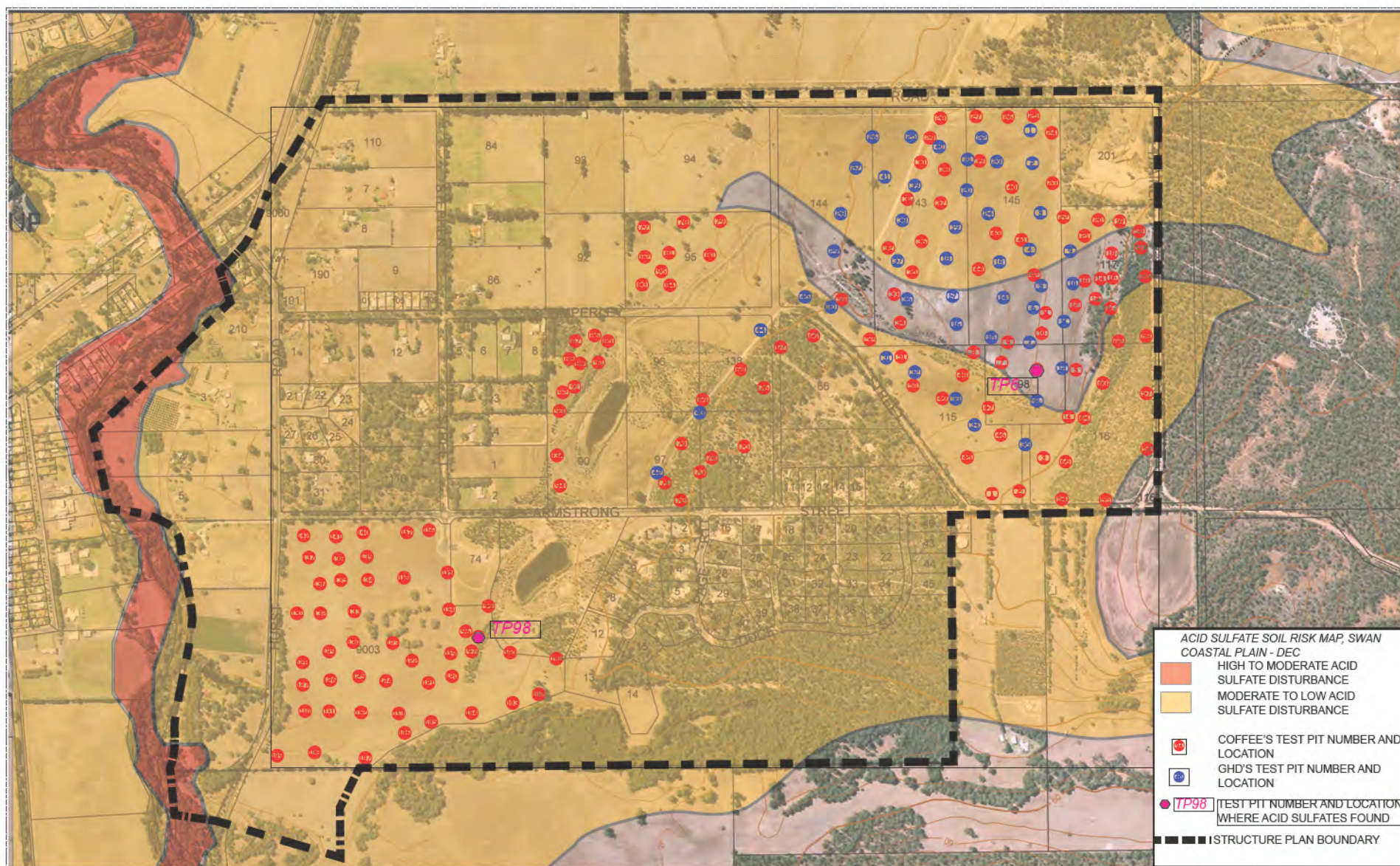
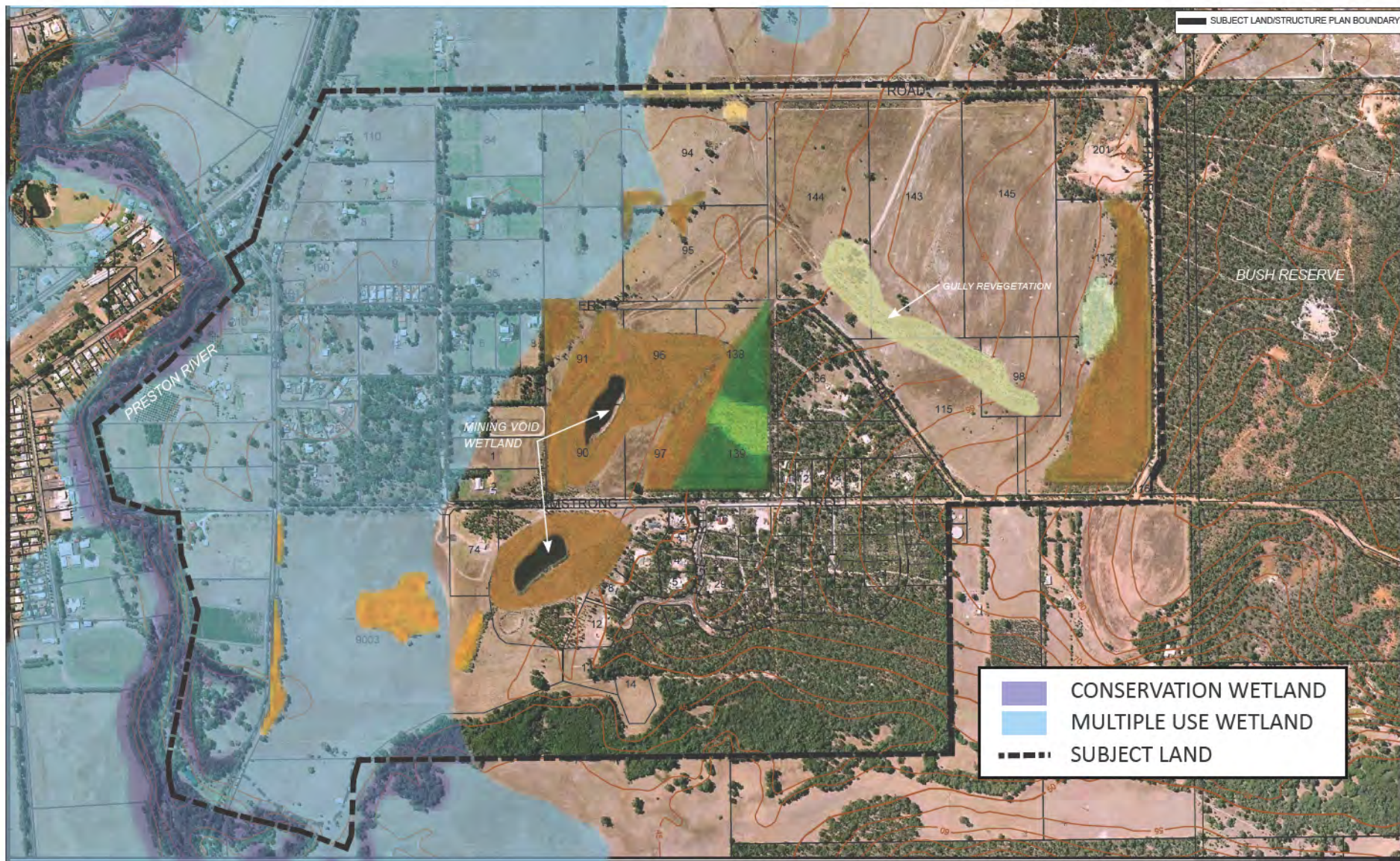


Figure 5 Soil Types





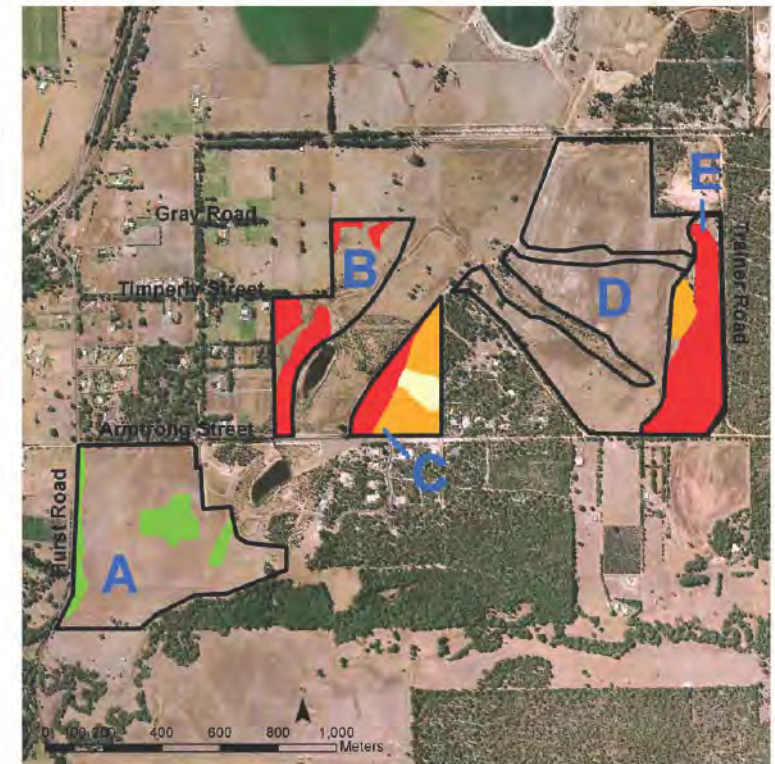
Vegetation Unit A – Woodland of *Eucalyptus marginata* over Open Low Woodland A of *Eucalyptus marginata* and *Corymbia calophylla* over Open Low Woodland B of *Banksia grandis* and *Xylomelum occidentale* over Low Scrub B of *Xanthorrhoea brunonis*, *Davesia physodes*, *Boronia spathulata* and *Hibbertia vaginata* over Dwarf Scrub C of *Hypocalymma robustum*, *Hovea trisperma*, *Dasypogon bromeliifolius*, *Scaevola calliptera* and *Labichea punctata* over Very Open Herbs of *Burchardia congesta*, *Dampiera linearis* and *Caladenia lateriflora* and Very Open Tall Sedges of *Tetraria capillaries* and *Patersonia umbrosa* on shallow gravelly sand.



Vegetation Unit B – Open Low Woodland of *Eucalyptus marginata* over Open Low Woodland A of *Banksia attenuate*, *Eucalyptus marginata* and *Xylomelum occidentale* over Open Low Woodland B of *Eucalyptus marginata*, *Banksia attenuate* and *Nuytsia floribunda* over Open Low Scrub A of *Acacia extensa* and *Jacksonia furcellata* over Low Scrub B of *Acacia pulchella*, *Adenanthos meisneri*, *Melaleuca thymoides* and *Philotheca spicata* over Low Scrub B of *Conostephium pendulum*, *Dasypogon bromeliifolius*, *Pimelea rosea* and *Stirlingia latifolia* over Very Open Herbs of *Conostylis aculeate* and *Lagenphora huegelii* and Open Low Sedges of *Phlebocarya ciliate* and *Johnsonia lupulina* on grey sand.



Vegetation Unit C – Woodland of *Eucalyptus marginata* and *Corymbia haematoxylon* over Open Low Woodland A of *Corymbia haematoxylon* and *Xylomelum occidentale* over Low Scrub A of *Acacia pulchella* and *Hakea amplexicaulis* over Low Scrub B of *Daviesia presissii* and *Xanthorrhoea brunonis* over Dwarf Scrub C of *Boronia spathulata*, *Hibbertia hypericoides*, *Hibbertia amplexicaulis* and *Xanthorrhoea gracilis* over Open Low Sedges of *Desmocladius fasciculatus* and *Patersonia umbrosa* on shallow gravelly sand.



Vegetation unit description	Habitat description	Vegetation/Habitat condition
Low open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> and <i>Corymbia calophylla</i> with some <i>Banksia attenuata</i> , <i>Xanthorrhoea preissii</i> and <i>Xylomelum occidentale</i> on deep bleached grey sands.	Foraging habitat for birds, reptiles and macrofauna (kangaroos). The overstorey species are approximately 20 years of age and no old growth present. Therefore there is a lack of tree hollows for nesting.	Good (4). Vegetation structure significantly altered by very obvious signs of disturbance, specifically kangaroo grazing. Retains basic vegetation structure and ability to regenerate it. (Keighery 1994)
Open forest of <i>Eucalyptus marginata</i> subsp. <i>marginata</i> - <i>Corymbia calophylla</i> with some <i>Banksia attenuata</i> , <i>Xanthorrhoea preissii</i> and <i>Xylomelum occidentale</i> on sandy gravel.	Foraging habitat for birds, reptiles and macrofauna (kangaroos). The overstorey is approximately 20 years old however the northern sections of this unit in planning sectors C and E contain remnant trees. These remnants have hollows that may be used as nesting habitats by birds, bats and/or macrofauna.	Good (4). Vegetation structure significantly altered by very obvious signs of disturbance, specifically timber extraction and kangaroo grazing. Retains basic vegetation structure and ability to regenerate it. (Keighery 1994)
Remnant stands of <i>Corymbia calophylla</i> in open paddocks.	Foraging habitat for birds.	Completely Degraded (6). The structure of the vegetation is no longer intact and the area has been severely disturbed by land clearing for agriculture. (Keighery 1994)
Post-fire rehabilitation. A variety of introduced tree and shrub species from the eastern Australia are evident with only a very low diversity and abundance of endemic species.	Possible foraging habitat for birds and reptiles.	Mortality of juvenile <i>Banksia grandis</i> trees within the area which may be associated with disease, <i>Phytophthora cinnamomi</i> .

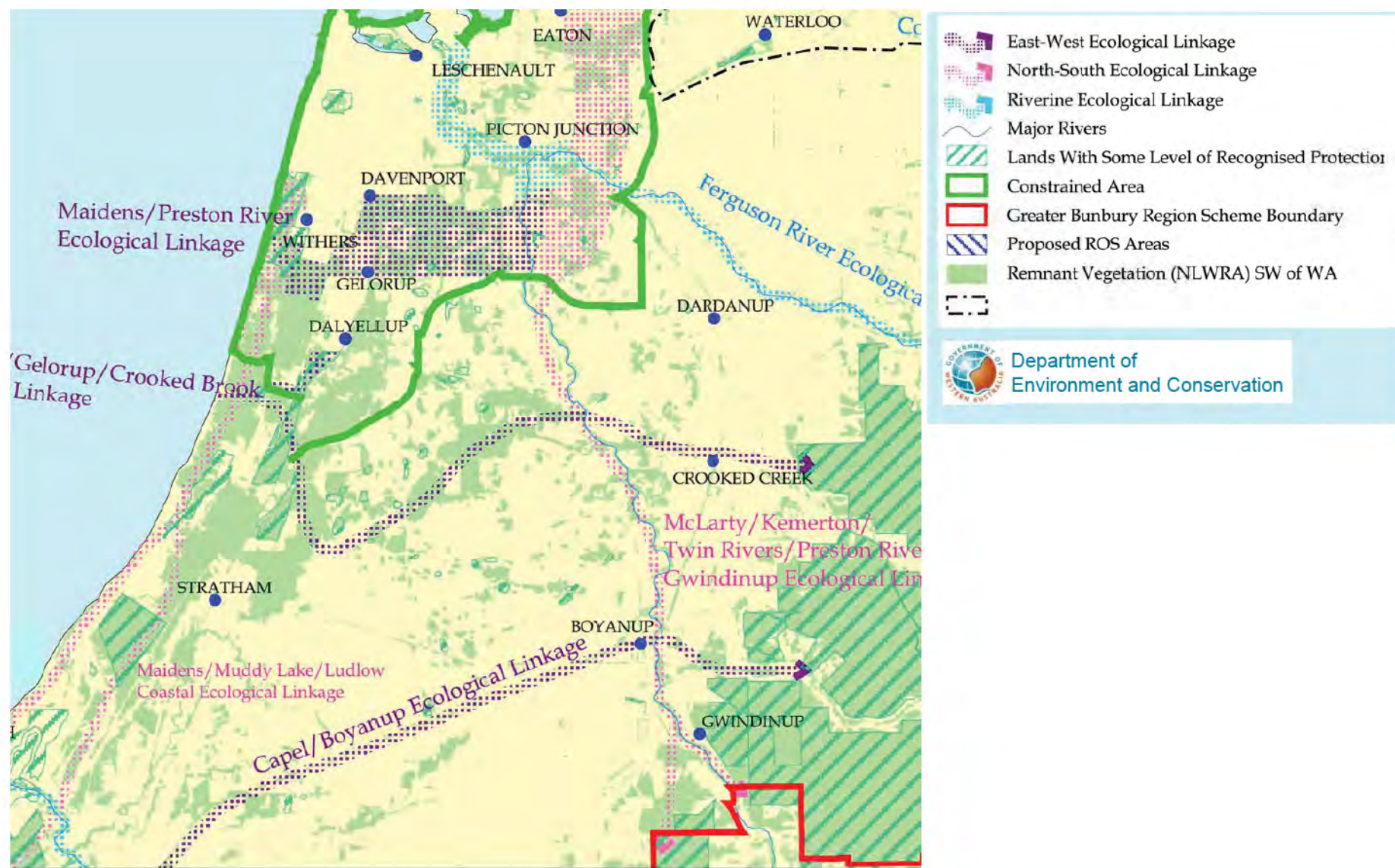
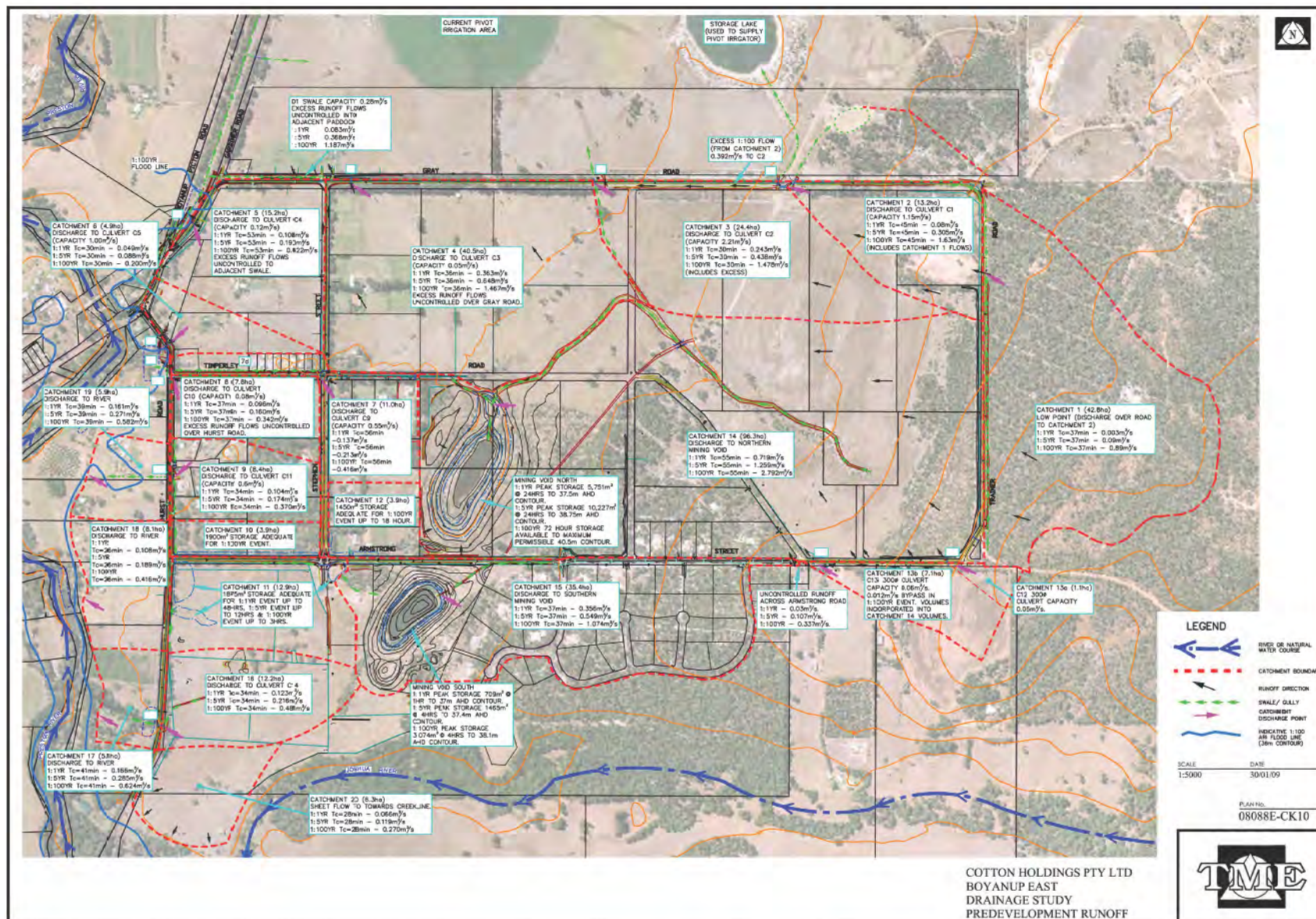


Figure 9 Ecological Linkages



Local materials can be used in the construction of drainage infrastructure to define a unique sense of place and setting. Water Sensitive Urban Design presents opportunities to incorporate drainage functions into a natural landscape setting that enhances open space and environmental functions.





COTTON HOLDINGS PTY LTD
BOYANUP EAST
DRAINAGE STUDY
PREDEVELOPMENT RUNOFF



Figure 12 Pre-Development Surface Water Conditions

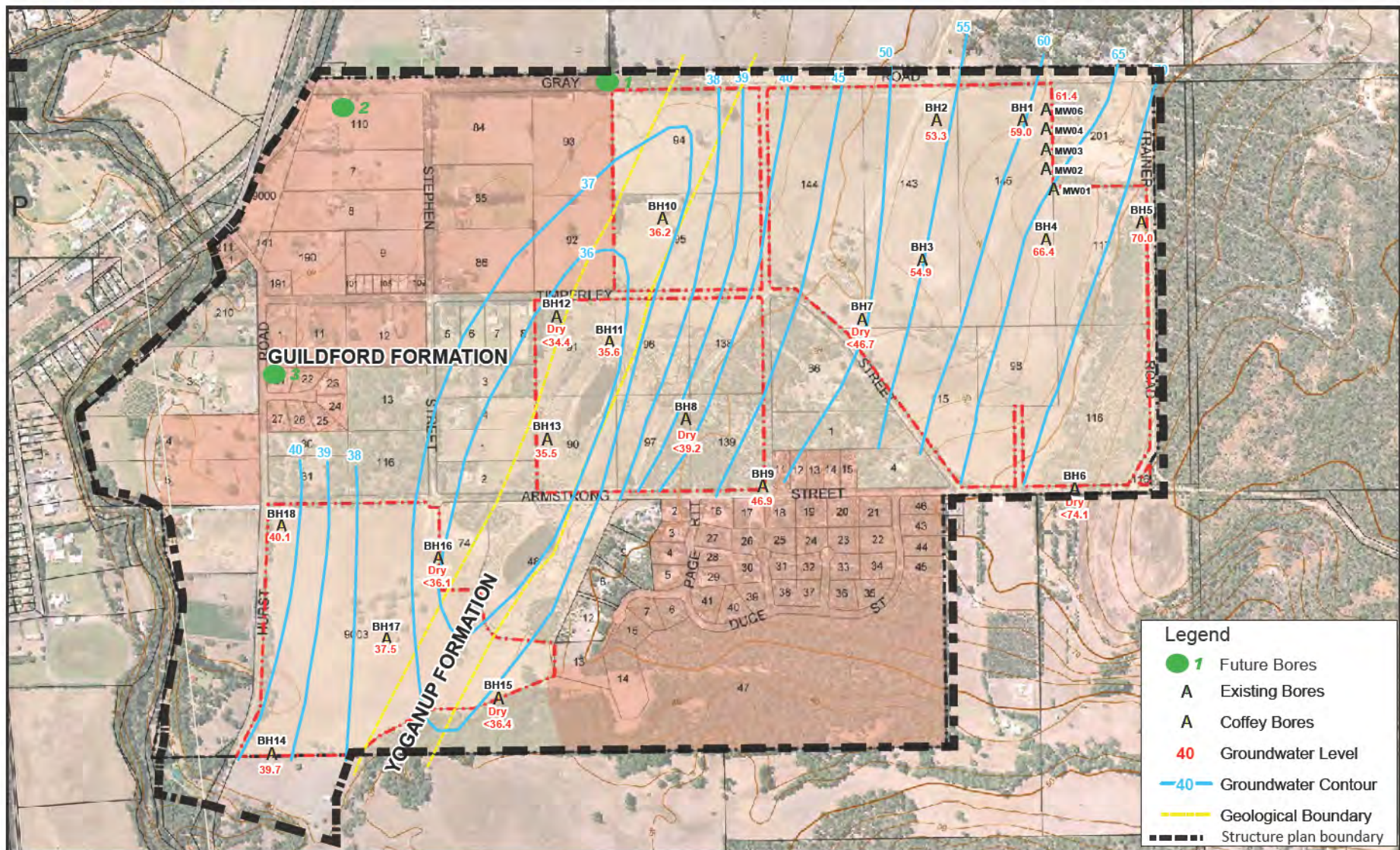


Figure 13 Pre-Development Ground Water Conditions

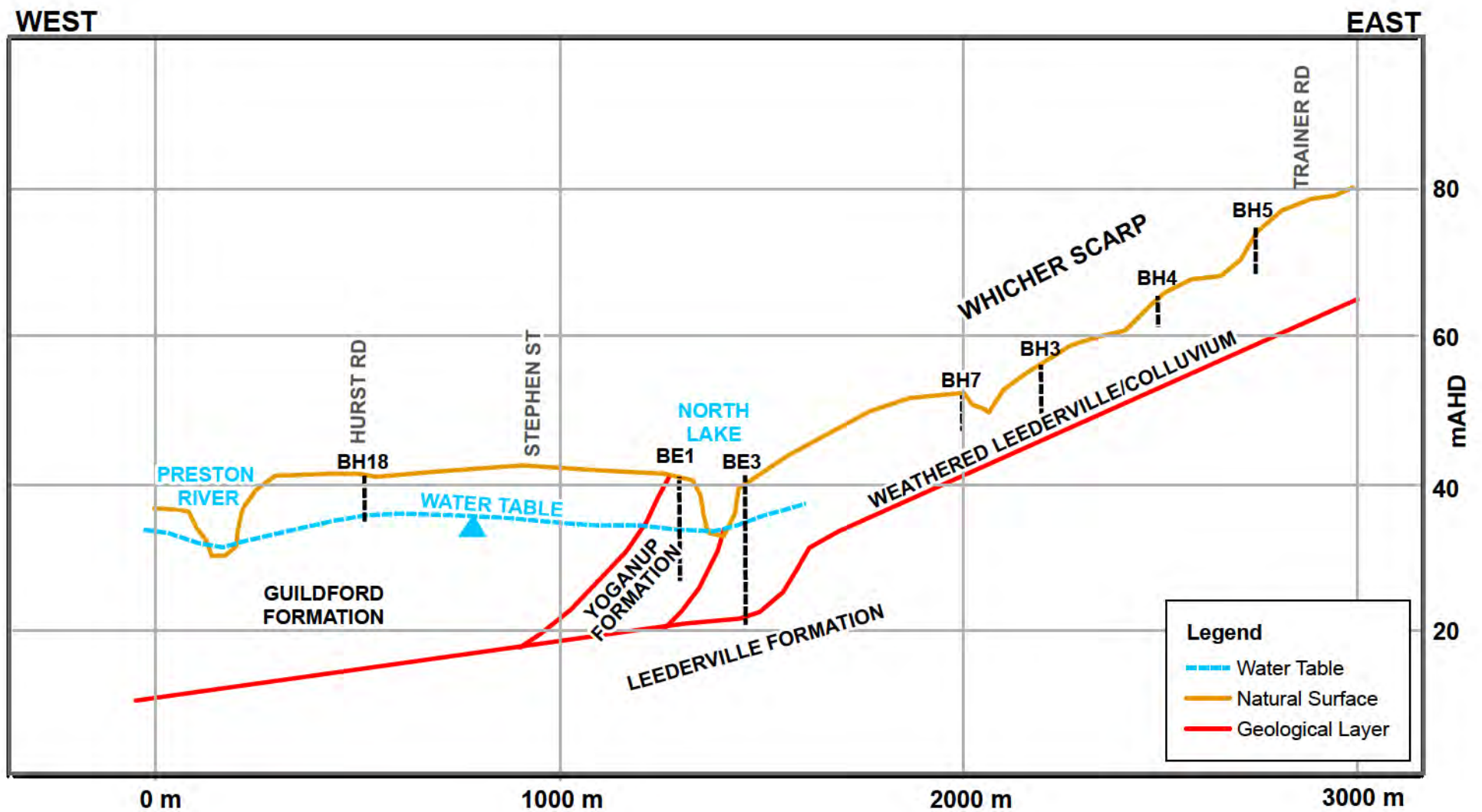
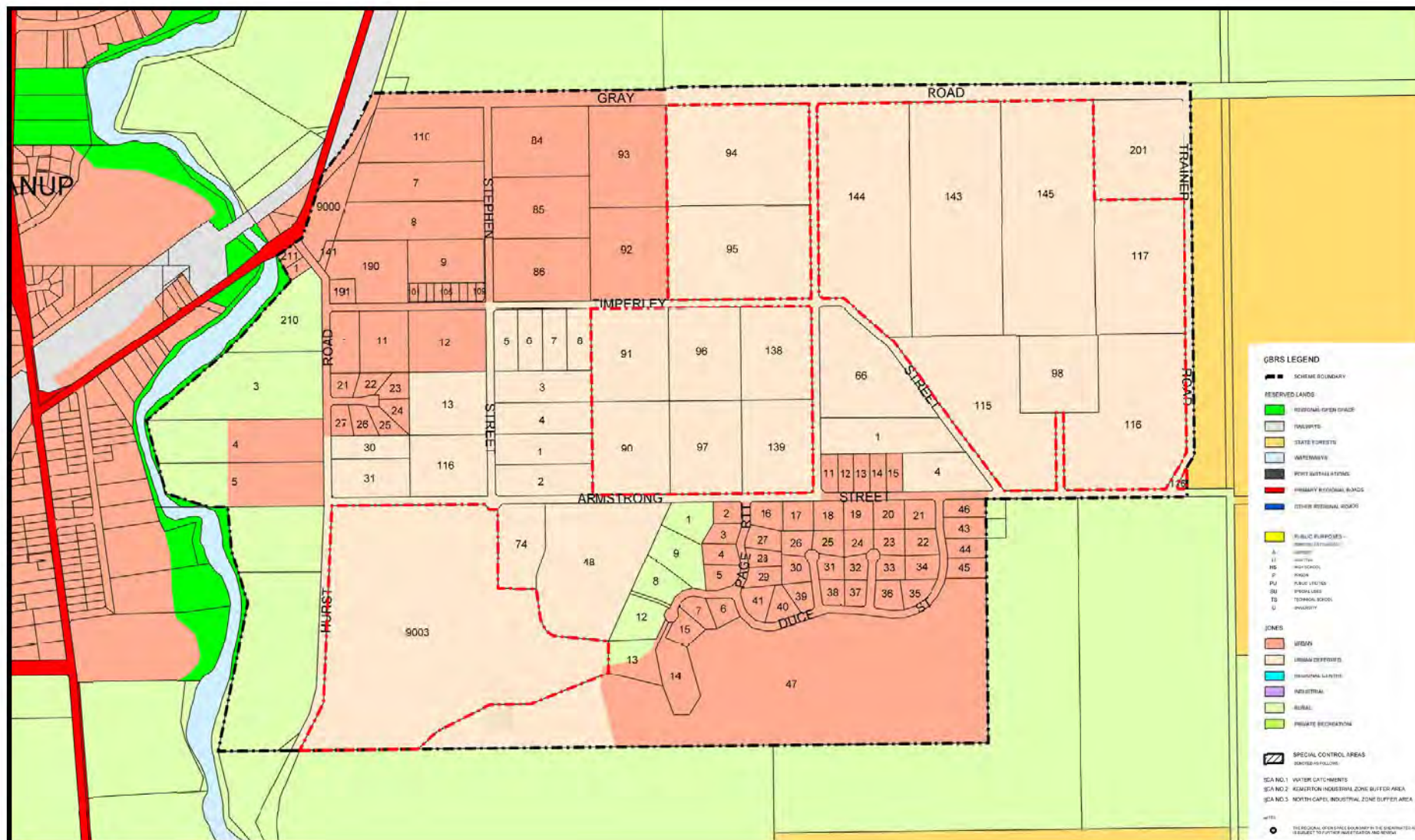


Figure 14 Typical Cross Section of Site Showing Indicative Groundwater Levels



PLANNING UNIT P2 - BOYANUP TOWNSITE
 PLANNING UNIT P3 - PRESTON SCARP & PLATEAU

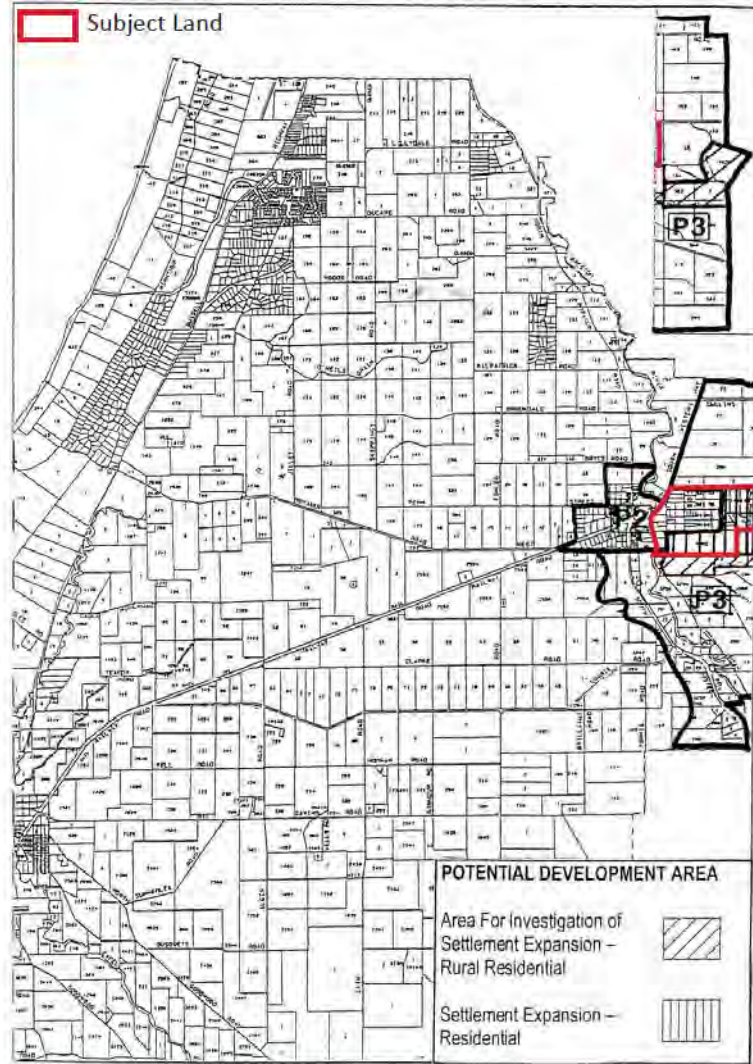
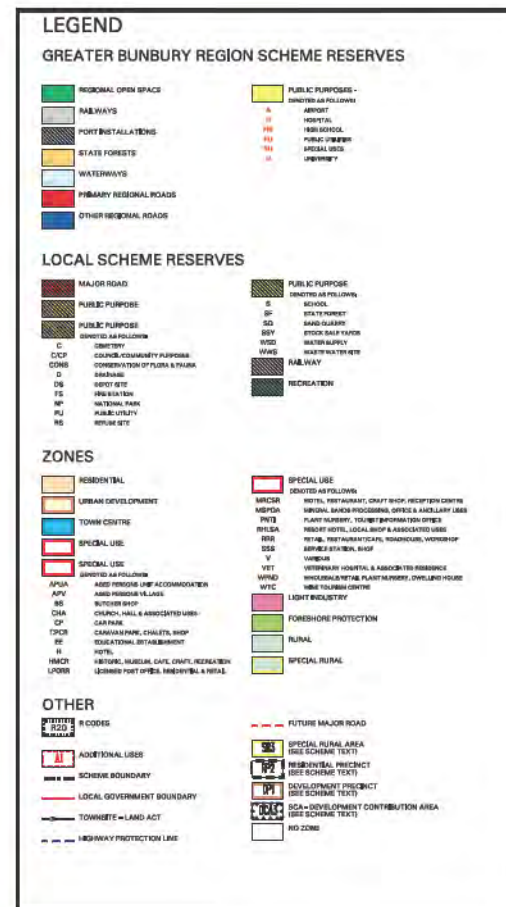


Figure 16 Shire of Capel Land Use Strategy



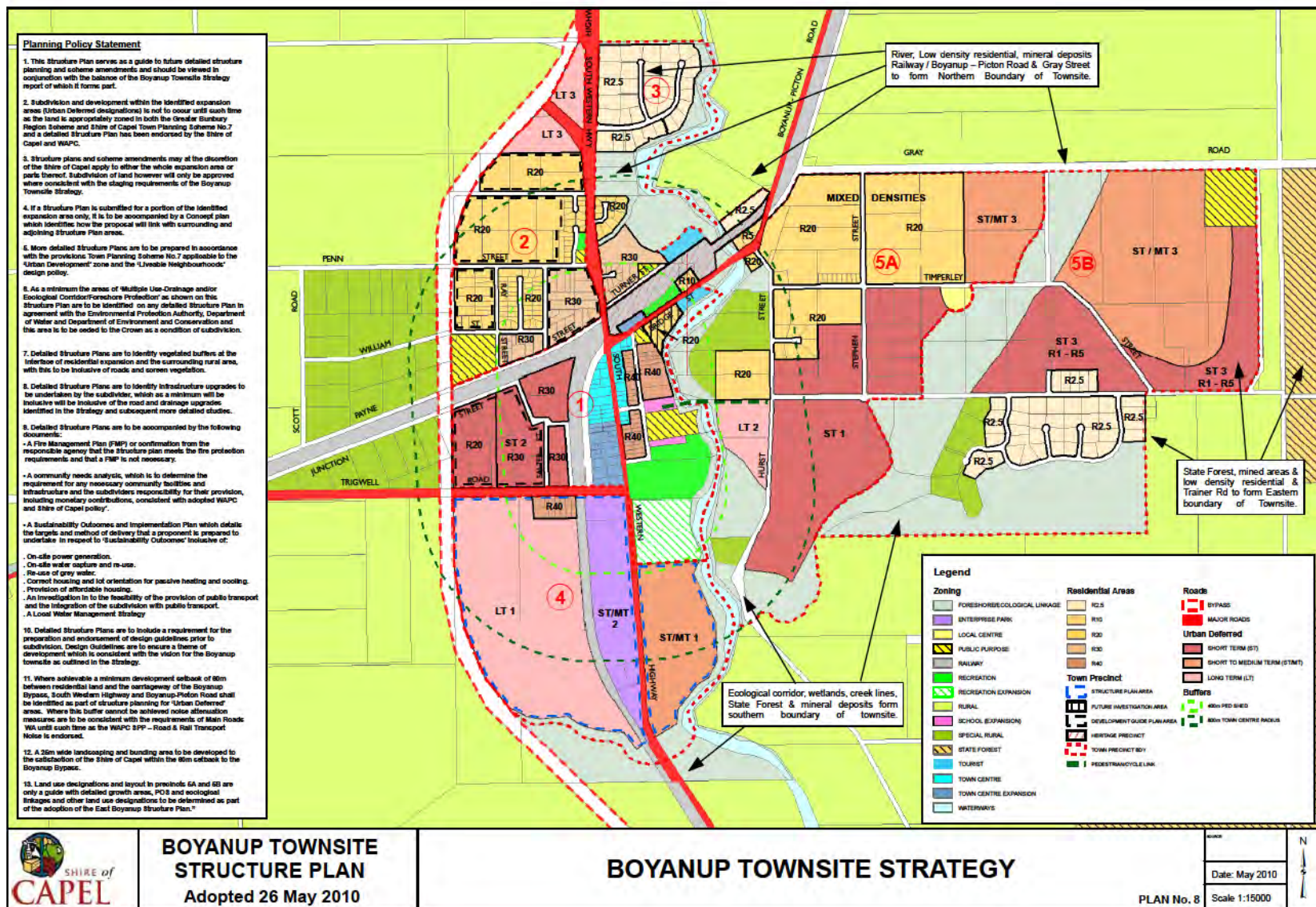


Figure 18 Boyanup Townsite Structure Plan

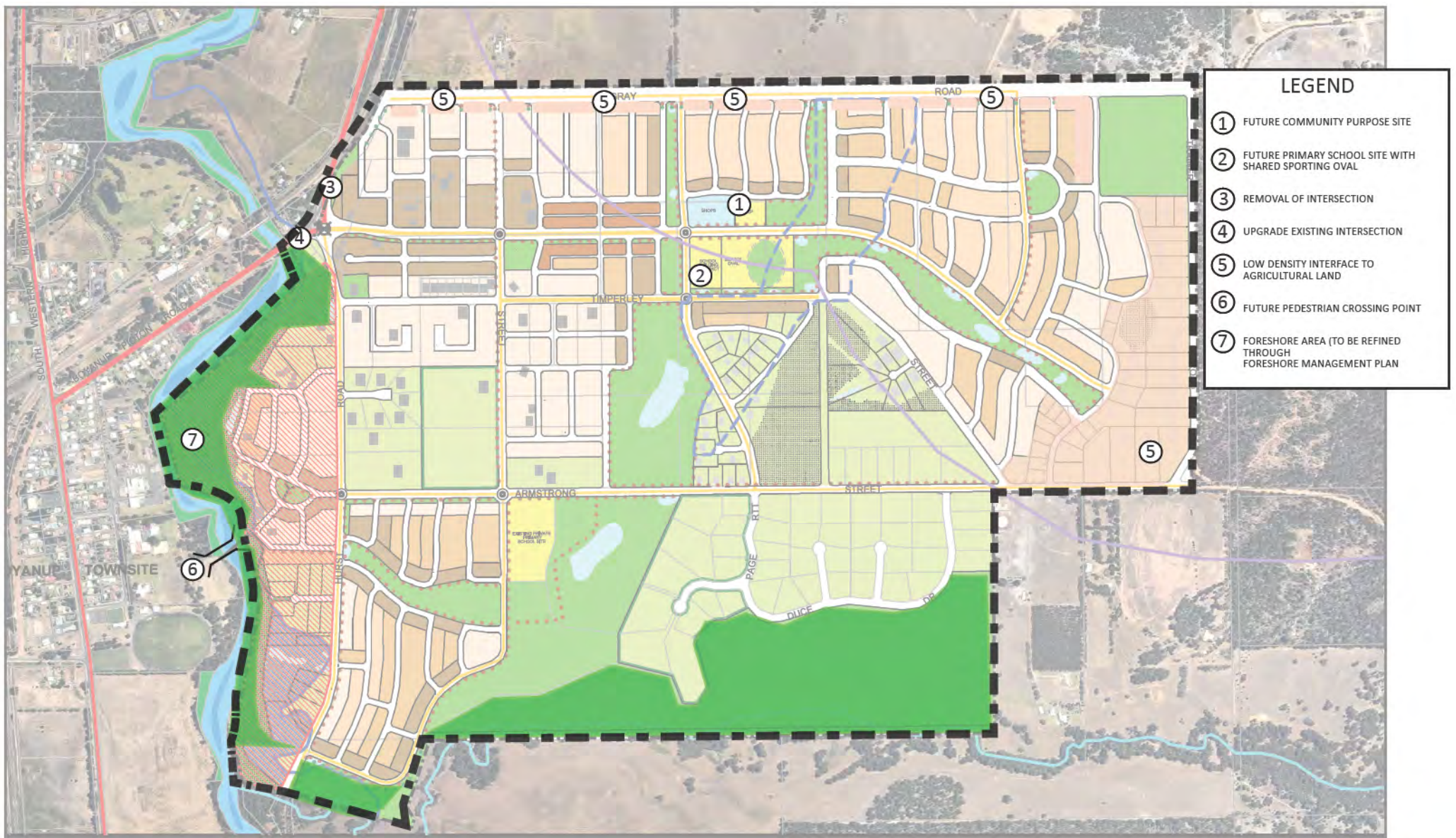




Figure 20 Joshua Brook Structure Plan



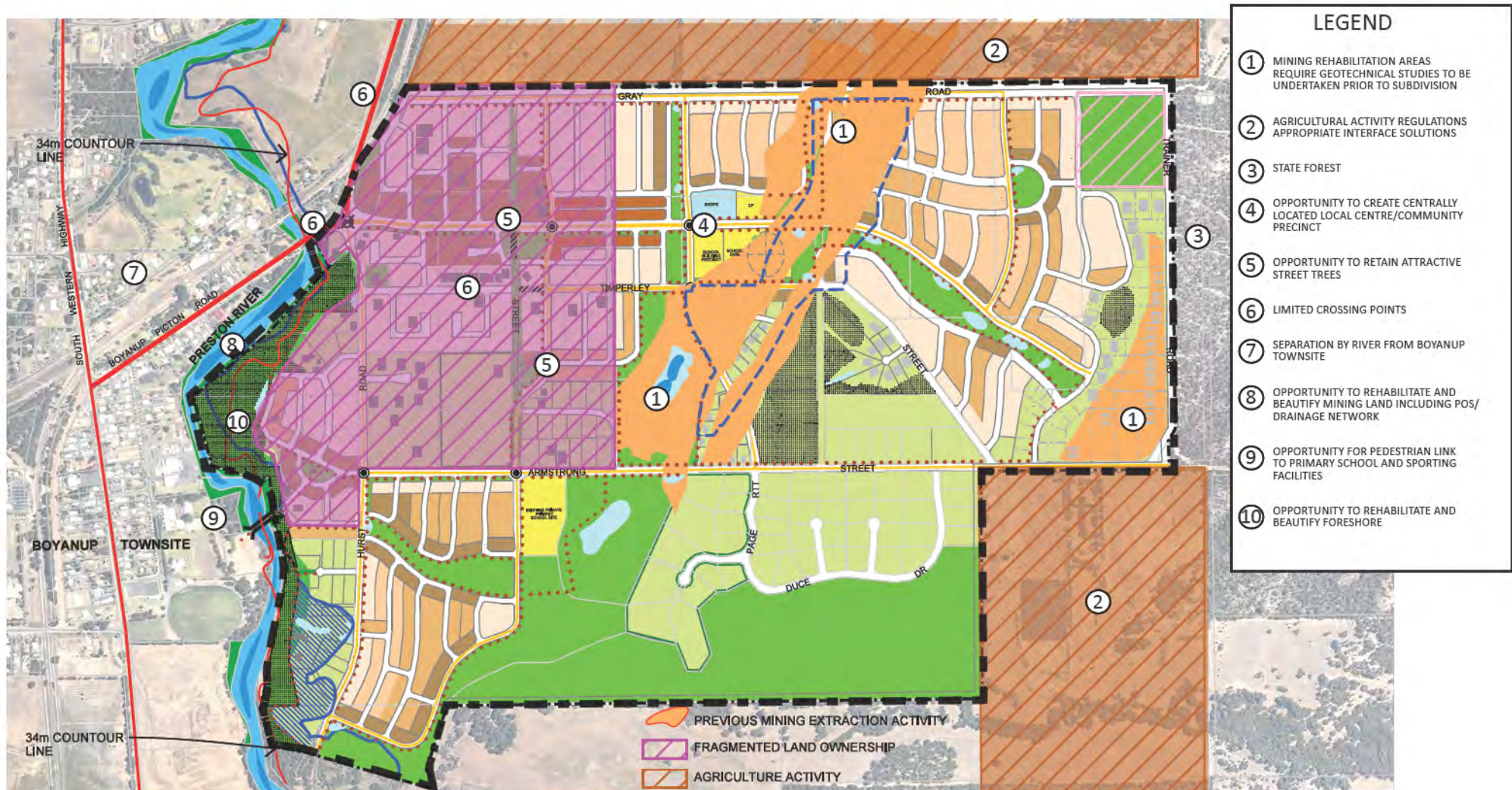


Figure 22 Opportunities and Constraints Map



Figure 23 Natural Framework



Figure 24 Distribution Of Open Space

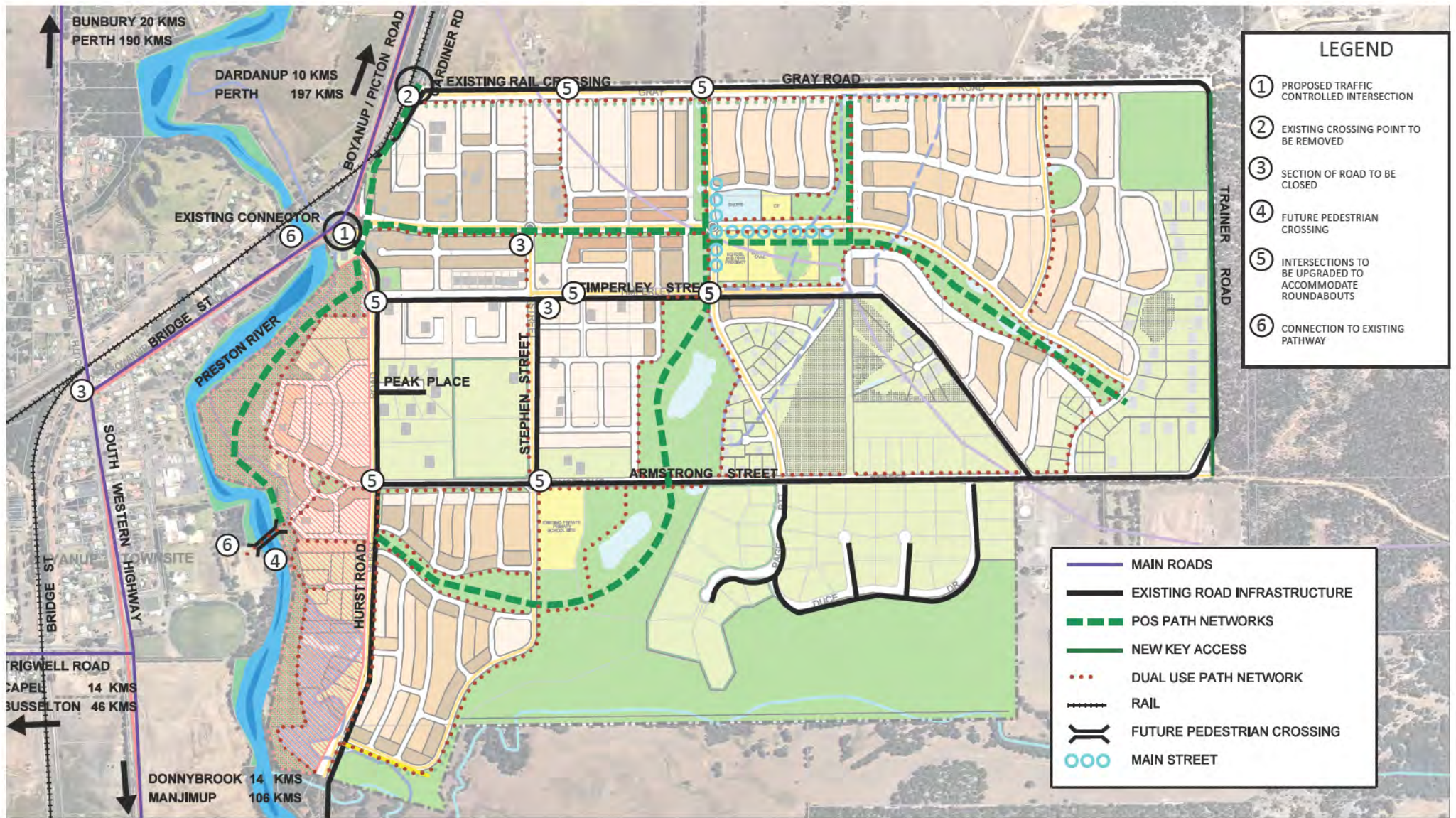


Figure 25 Movement & Transport Framework



Figure 26 Open Space and Recreation Framework



Figure 27 Landscape Master Plan Map

Streetscapes (street trees and verges)

- To create streetscapes that creates flavours of a rural village through selection of native street trees and low shrubs and ground covers.
- To unify identification through use of Peppermint trees for residential environments.
- To create easily identifiable precincts through selections of selections of low shrubs and ground covers.
- To emphasise the importance of the Boyanup Village Main Street through plantings of Macadamia trees.
- To promote native species plantings within front setback areas and prohibit use of grassed areas in road verges.



Macadamia



Agonis flexuosa



Dianella revolute



Acacia Lasiocarpa

Open Space Planting

- To create easily identifiable open space environments within the urban environment
- incorporate and promote low maintenance management and sustainability through careful selection of local native species and sensitive water management and design.
- Emphasise site lines and vistas through the specific plantings to improve legibility and create attractive focal points and vistas, outlooks
- To create attractive shaded pedestrian path networks within multiple use and open space corridors;
- To create bush food corridors that connect the Boyanup Village precinct to achieve a harmonious marriage of functional and aesthetic values and promote positive community awareness of nature.



Eucalyptus megacarpa (Bullich)



Ficinia nodosa



Eucalyptus calophylla (Marri)



Acacia Lasiocarpa



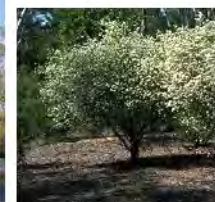
Dianella revolute

Foreshore Environmental Planting

- To assist in rehabilitating the foreshore environmental functions
- To provide attractive and functional settings for passive recreational activity



Eucalyptus Rudis



Melaleuca Viminea



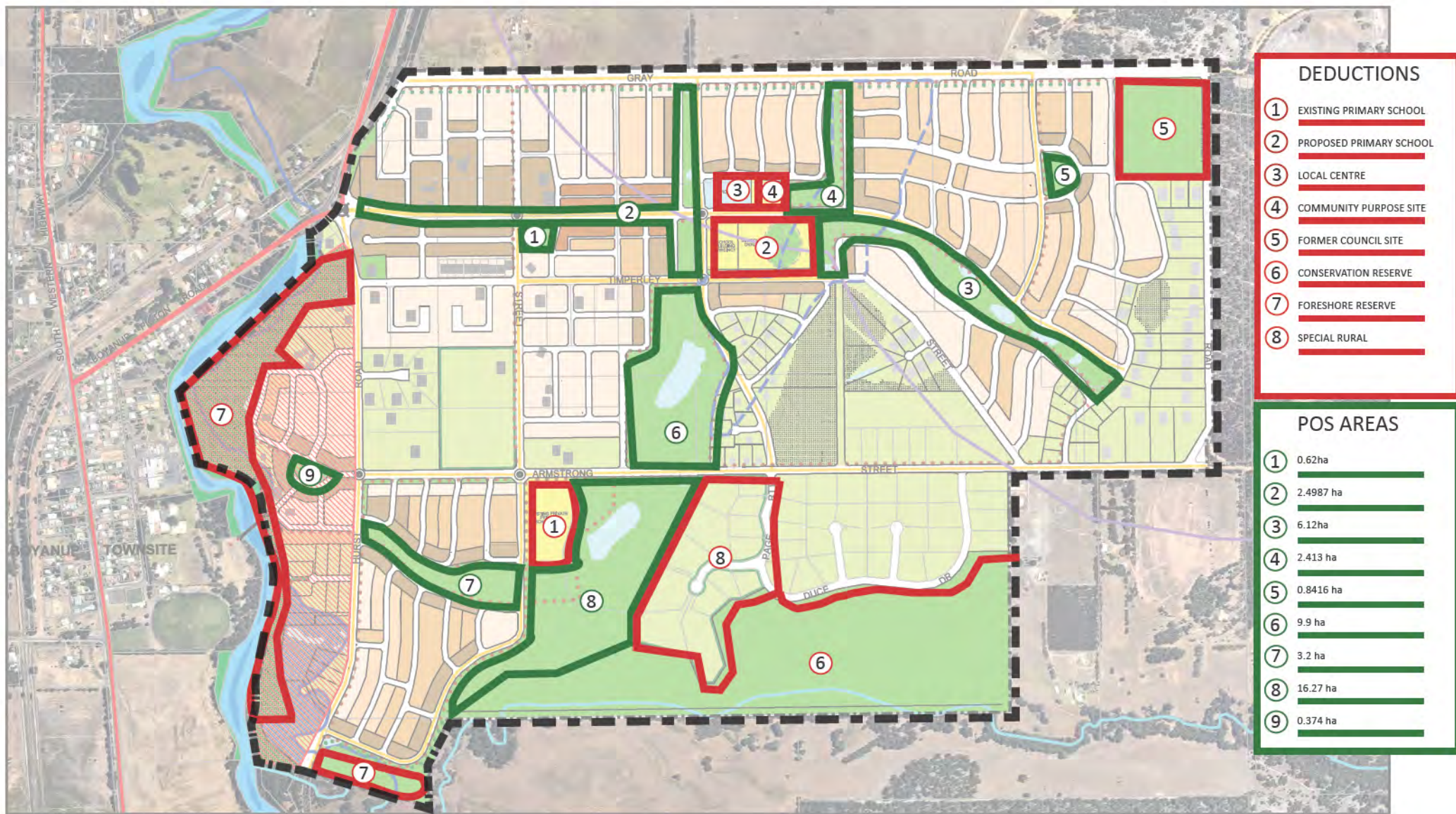
Melaleuca Rhaphiophylla



Acacia Lasiocarpa



Dianella revolute



	net residential cell area estimates	Dwelling Yield	
		estimated yields (1)	Estimated Yields (2)
R10	52.57ha	525	438
R12.5	17.223ha	215	180
R15	22.84ha	342	288
R20	13.69ha	273	228
R30	4.75ha	158	98
Special Residential	84.98ha	242	242
Special Rural	10.84ha	13	13
Totals		1768	1487
Estimated population		4420	3717

Notes

Note 1: Estimated Yields (1) is calculated on the basis of the average R Code areas stipulated in Table 1 of the R Codes

Note 2: Estimated Yields (2) is calculated on the estimated achievable yields (based on analysis of Dalyellup East Example)

Note 3: Dalyellup East achieved:

- Average lot size of 598m² for R20 lots (119%)
- Average lot size of 483m² for R30 lots (161%)

Note 4: In calculating Estimated Yields (2), the following was used:

- R30 Average lot size 483m² (161%)
- R20 Average lot size 598m² (119%)
- R15 Average lot size 792m² (119%)
- R12.5 Average lot size 952m² (119%)
- R10 Average lot size 1200m² (119%)
- Special Res Average lot size 3500m²

It is noted that this model does not take into account additional constraints resulting from existing dwellings and fragmented ownerships. It is likely that the final achievable dwelling yield will be less than stated.

Note 5: Net residential cell areas are based on areas available for residential sale (excludes POS, local roads, commercial land etc).

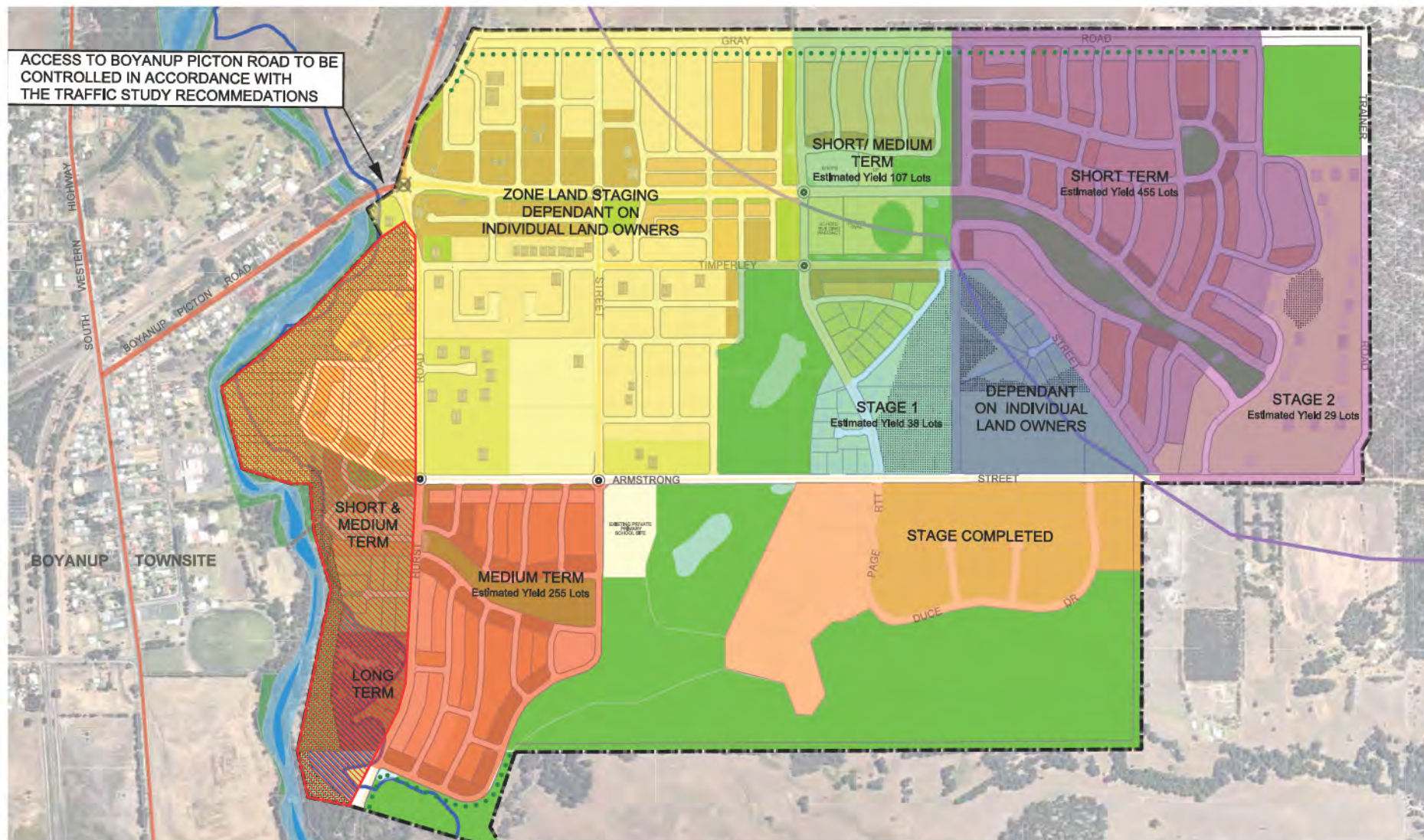
Note 6: Population estimate assumes an occupancy rate of 2.5

Development and Open Space Statistics			
Site Area			386.6752ha
Deductions:			
Conservation Reserve	34.0960ha		
Foreshore Reserve/Wetland Buffer	12.5528ha		
Drainage Reserves	6.3663ha		
Community Purpose Site	0.5878ha		
Local Centre	1.0000ha		
Special Rural Land	10.8800ha		
Proposed Primary School Site	4.0000ha		
Existing Primary School Site	0.5704ha		
Former Council Refuse Site	5.9600ha		
total Deductions			76.0133ha
Gross Subdivisible Area			307.6619ha

Public Open Space Required			30.7662ha
Minimum Unrestricted		24.6129ha	
Maximum restricted Area		6.1532ha	

Public Open Space Provision			
Area 1	0.62		
Area 2	2.4987		
Area 3	6.12		
Area 4	2.413		
Area 5	0.8416		
Area 6	9.9		
Area 7	3.2		
Area 8	16.27		
Area 10	0.374		
Total	42.2373		
Drainage Area Estimate	6.3662		
Unrestricted POS	35.8711		35.8711ha (11.66%)

Note: Drainage area calculations have been based on the previously prepared drainage plan. This will require review and may necessitate a change in the actual land area requirements for drainage. However, it is envisioned that any change will be minor and of no consequence in relation to achieving the required POS areas.



Note: Yields Identified are based on average lot sizes specified under the residential design codes. Actual yields may change when subject to detailed design