



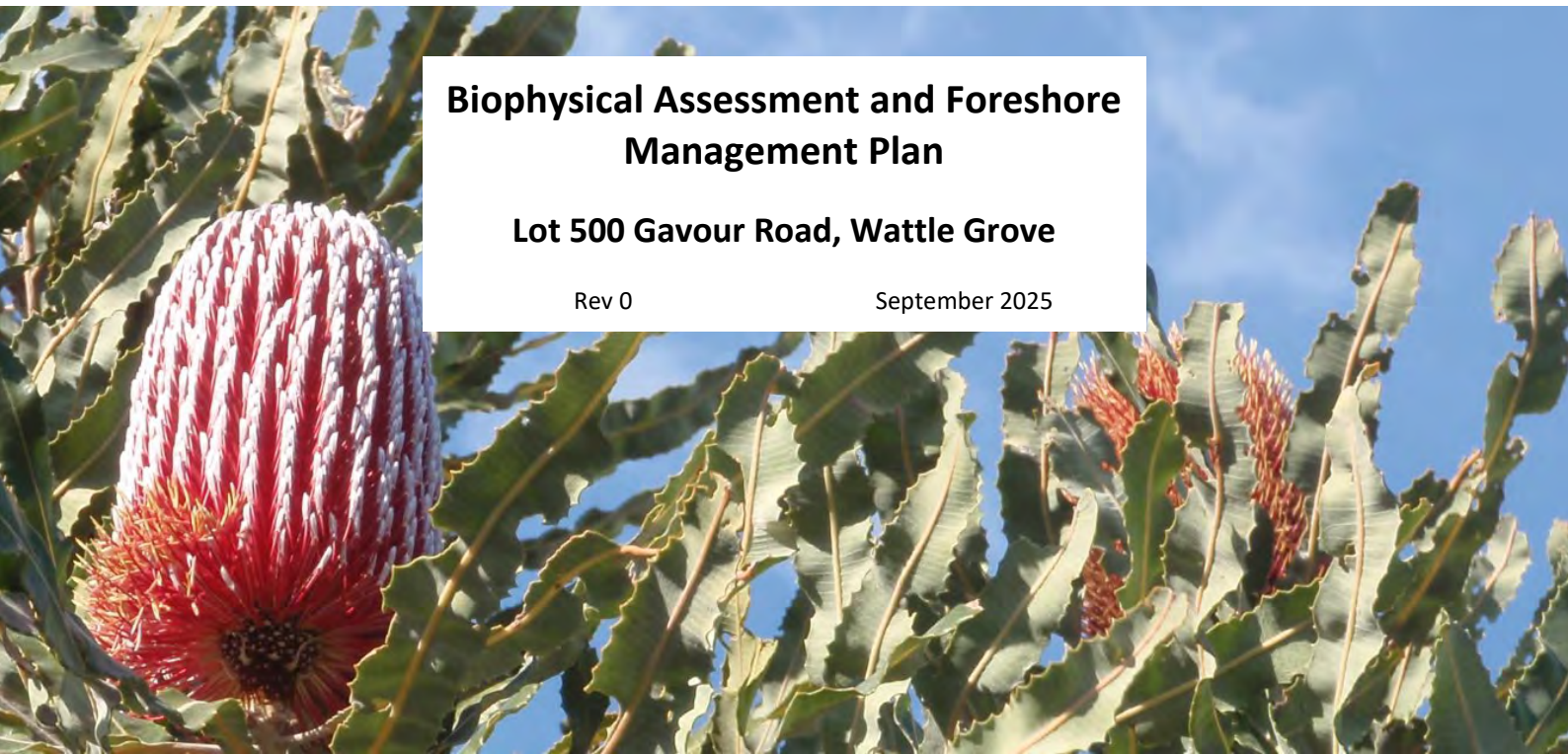
COTERRA
ENVIRONMENT

Biophysical Assessment and Foreshore Management Plan

Lot 500 Gavour Road, Wattle Grove

Rev 0

September 2025



CALIBRE | COMMITMENT | COLLABORATION

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1 Introduction

1.1 Project Background

Providence Lifestyle is progressing the design and development of Lot 500 Gavour Road, Wattle Grove (the site; Figure 1) for an integrated aged care facility. The site is approximately 15.2 hectares (ha) in size, and has a north-west to east-south orientation, bound by Gavour Road and Welshpool Road within the City of Kalamunda. The site is zoned 'Rural' under the Metropolitan Region Scheme (MRS) and 'Special Use' under the City of Kalamunda Local Planning Scheme No. 3 (CoK, 2025).

1.2 Planning Context

The site is subject to a Local Development Plan (LDP), which was adopted by the City of Kalamunda in 2019 (Appendix 1). Relevant environmental considerations of the LDP include:

- Rehabilitation of the Crystal Brook vegetation environment is to be detailed at the relevant Development Application stage. Existing vegetation associated with Crystal Brook to be retained where possible.

1.3 Proposed Development

The proposed development includes:

- 190 homes
- Various facilities (clubhouse, pickleball courts, wellness retreat etc.).

The above dwellings will be developed across eight stages, with an additional aged persons area located adjacent to Welshpool Road East to be developed in future.

All dwellings will be connected to the Water Corporations reticulated sewerage system, which is considered to be an improved environmental outcome in comparison to the LDP which shows effluent management on-site.

1.4 Purpose and Objectives of Report

To ensure environmentally sustainable outcomes of the proposed development, an assessment has been undertaken regarding the extent of the foreshore associated with Crystal Brook, which traverses the southern portion of the site (Figure 1).

The biophysical assessment (refer Section 3) was prepared in accordance with the biophysical criteria as defined in the Water and Rivers Commission's *Water Notes WN23: Determining Foreshore Reserves* (WRC, 2001), being:

- **Vegetation:** fringing and upland remnant vegetation associated with, or influencing the waterway
- **Hydrology:** flood prone land and areas subject to waterway channel changes
- **Soil type:** soil types that define the extent of foreshore vegetation
- **Erosion:** soil types prone to erosion
- **Geology:** geological features that influence the waterway
- **Topography:** landscape features include slope, shape and composition of landforms that influence or are influenced by the waterway

- **Function:** the foreshore function, i.e., flood protection, recreation or habitat conservation
- **Habitat:** habitats such as river pools, woody debris, riffles and riparian vegetation
- **Climate:** climatic variations and resultant changes in water levels
- **Land use:** areas that may be harmed by increased land use pressure
- **Heritage:** archaeological and ethnographic sites.

As an outcome of the biophysical assessment, a Foreshore Management Plan (FMP) has been prepared and applies to the defined area considered the Crystal Brook creekline and associated foreshore (herein referred to as the 'management area') (refer Section 4).

1.5 Associated Reports

This report has been prepared in addition to the following document to support Providence Lifestyle's Development Approval (DA), and should be read in conjunction with the following:

- Environmental Summary Report (Coterra Environment, 2025)
- Drainage Management Plan – Providence Lifestyle, Lot 500 Gavour Road, Wattle Grove (Design Engineering Consultants)
- Engineering Services Report – Providence Lifestyle Village, Lot 500 Gavour Road, Wattle Grove (Design Engineering Consultants)
- Traffic Impact Assessment – Lot 500, Gavour Road, Wattle Grove (PJA)
- Landscape Concept Package – Wattle Grove Lifestyle Resort (Plan E).

1.6 Relevant Guidance Documents

1.6.1 Environmental Factor Guideline: Inland Waters (EPA, 2018)

This guideline provides an outline of how Inland Waters is considered by the Environmental Protection Authority (EPA) in the environmental impact assessment (EIA) process, including assessment of potential environmental impacts, implications of cumulative impacts, the mitigation hierarchy (direct and indirect impacts), management approaches and predicted residual impacts (EPA, 2018).

1.6.2 Better Urban Water Management (WAPC, 2008)

This document provides guidance on the implementation of State Planning Policy 2.9 Water Resources (WAPC, 2006), which is a requirement of the State Water Strategy for Western Australia (WAPC, 2003).

The intentions of the Better Urban Water Management document are (WAPC, 2008):

- To facilitate better management and use of our urban water resources by ensuring an appropriate level of consideration is given to the total water cycle at each stage of the planning system
- To assist regional, district and local land use planning, as well as subdivision and development phases of the planning process
- To provide a framework for how water resources should be considered at each planning stage by identifying the various actions and investigations required to support the planning decision being made
- To identify agencies responsible for provision of water resource information

The document should be applied to both new greenfield and urban renewal projects where residential, commercial, industrial and rural residential uses and development are proposed, including rural townsite areas.

1.6.3 Environmental Guidance for Planning and Development – Guidance Statement 33 (EPA, 2008)

The purpose of EPA Guidance Statement 33 – Environmental Guidance for Planning and Development is (EPA, 2008):

1. To provide an overview of environmental protection processes and information, to assist land use planning and development in Western Australia
2. To describe referral and environmental impact assessment processes under Part IV of the Environmental Protection Act 1986 and, in particular, the procedures applied to schemes
3. To provide the EPA's advice on a range of environmental factors in order to assist participants in land use planning and development to protect, conserve and enhance the environment.

Specifically, EPA Guidance Statement 33 relates to this report as it outlines:

- The significance of waterways
- Key threats and issues
- The EPA's broad principles for the protection of waterways
- The relevance of considering waterways during planning
- Appropriate buffers to waterways

1.6.4 Draft State Planning Policy 2.9 Planning for Water (WAPC, 2021)

The intent of the draft Policy is to ensure that planning and development considers water resource management and includes appropriate water management measures to achieve optimal water resource outcomes. The objectives of the Policy are (WAPC, 2021):

1. Protect and improve the environmental, social, cultural and economic values of the State's water resources
2. Protect public health and the long-term supply of good quality and affordable drinking water
3. Manage the risk of riverine flooding to people, property and infrastructure
4. Ensure the secure and sustainable supply, use and re-use of water resources
5. Ensure future development is resilient to the water-related impacts of climate change
6. Minimise future costs and protect public health by ensuring that appropriate wastewater infrastructure is provided.

1.6.5 Guidance for planning and development: Protection of naturally vegetated areas in urban and peri-urban areas (EPA, 2021)

The purpose of this document is to set out the views and expectations of the EPA for the protection of naturally vegetated areas in the design of urban and peri-urban development proposals, and applies to strategic planning, new schemes and scheme amendments, structure plans and subdivision and development proposals in urban and peri-urban areas of Western Australia. Although urban and peri-urban areas are the focus of the guidance, the guidance may also be applied to proposals impacting any naturally vegetated areas in Western Australia.

The guidance is to be used to avoid, minimise or rehabilitate impacts on naturally vegetated areas, encouraging planners, developers, proponents and referrers to integrate design advice in this guidance during project planning (EPA, 2021).

1.6.6 Kalamunda Clean and Green Local Environment Strategy 2019 – 2029

The purpose of the City of Kalamunda Local Environment Strategy (LES) is to assist in protecting the landscape character of Kalamunda and guide improvements in the City's own operations and its work with stakeholders and community groups.

The LES provides the framework to manage environmental pressures and improve sustainable practices over the next decade and beyond. It will assist in protecting the landscape character of Kalamunda and guide improvements in the City's own operations and its work with stakeholders and community groups. The LES is organised into four key themes:

- The value of green space and natural areas
- Conserving natural resources
- Reducing waste
- Managing the impacts.

1.6.7 City of Kalamunda Urban Forest Strategy

The purpose of the City of Kalamunda Urban Forest Strategy (UFS) is to guide the strategic and holistic management of the City's urban forest, with consideration to trees on both public and private land, as well as the role and amount of canopy cover in different land uses.

The strategy identified goals and objectives to protect and grow the urban forest, and outlines specific, measurable actions needed to achieve these. The UFS defines the urban forest as:

- All trees greater than 3 m in height that occur within the City of Kalamunda, except for trees within the Perth Airport locality and trees on land reserved as state forest, national parks and regional parks.

1.6.8 City of Kalamunda Local Biodiversity Strategy

The City of Kalamunda Local Biodiversity Strategy (LBS) was developed to guide the retention, conservation and management of Local Natural Areas (LNAs) for the perpetual wellbeing of the City's residents, enterprise and ecosystem. The LBS aims to identify conservation priorities and methods to improve biodiversity, retain natural ecological processes and protect and enhance LNAs to provide a resilient place for people, enterprise and ecosystems to flourish into the future.

1.6.9 Water Notes WN23: Determining Foreshore Reserves (WRC, 2001)

This guidance note was developed to inform the protection and management of foreshore areas in Western Australia by introducing the use of biophysical criteria for defining foreshore reserves. This document describes the process for defining foreshore reserves by using biophysical criteria, which are the physical and biological features of a waterway.

1.6.10 Operational Policy 4.3: Identifying and establishing waterways and foreshore areas (DoW, 2012)

This policy describes the process for identifying, establishing and managing waterways and foreshore areas, as well as protecting their values from land use changes in the area around and adjacent to them. The policy aims to ensure that foreshore areas are properly identified in order to maintain or improve the environmental, social and economic values of waterways and adjoining land.

Key elements of the policy include:

- Delineation of waterways and foreshore areas
- Ensuring that these areas are considered in land use planning and development
- Implementing environmental protection measures for waterways and foreshore zones

1.6.11 Providing guidance on sustainable management practices. City of Kalamunda Draft Local Planning Policy 34 (CoK, 2021)

This draft local planning policy has been developed to provide clear policy and guidance around the management of wetlands, their buffers, waterways and their foreshores, to ensure consistent and sustainable management of these sensitive ecosystems as part of the planning process.

Finalisation of the draft local planning policy has been postponed ensuring alignment with the State Planning Policy 2.9 Planning for Water (SPP 2.9) and Planning for Water Guidelines, which are also in draft and have yet to be finalised and gazetted.

The draft Guidelines recommend a minimum setback distance from each side of the waterway (from the high water line) of not less than 15 m.

2 Existing Environment

2.1 Climate

The closest Bureau of Meteorology weather station to the site is Gosnells which is located approximately 5 km to the southwest of the site.

Gosnells experiences an annual mean rainfall of 776.0 mm, with highest mean rainfall experienced in June (160.5 mm) and lowest mean rainfall experienced across warmer months. Mean maximum temperatures are highest in January and February (average of 33.0°C; highest recorded temperatures in February of 46.0°C) and mean minimum temperatures are recorded in July (average of 8.9°C; lowest recorded temperature 0.5°C) (BoM, 2025)

Strongest winds experienced by the Gosnells locality are summer morning easterlies and afternoon south-westerlies. In winter, strongest winds in the morning arise from a north- north-easterly direction, and afternoon winds from the west (BoM, 2025).

2.2 Topography and Landform

Topography at the site generally slopes downward in a north-westerly direction toward Welshpool Road East and varies in height ranging from approximately 49 metres Australian height datum (mAHD) in the south, to 37 mAHD in the northern end of the site (MNG Access, 2025) (Figure 1).

Within the southern portion of the site is Crystal Brook, which forms an incised gully that is approximately 1 to 2 m below ground level in the area in which it traverses the site (Strategen, 2014).

2.3 Geology and Soils

Regional mapping within the management area indicates that soils comprise the following units (Jordan, 1986) (Figure 1):

- Northern and north-eastern parts of the site: Gravelly Silt (Mgs2) - strong brown, tough, common pebbles of fine to coarse grained, subrounded granite, some dolerite and rare sandstone, variable sand content
- Southern part of the site: Sand (S12) - structureless, yellow, fine-grained, subangular and medium to coarse grained subrounded to rounded quartz, feldspar and heavy minerals common, minor silt and clay

The Mgs2 unit has a Class II 'moderate to low' risk of Acid Sulphate Soils occurring within 3 m of the surface, with unit S12 no identified as posing an ASS risk (Figure 1).

The Department of Primary Industries and Regional Development (DPIRD) broad scale mapping indicates the following soil subsystems occur within the site (DPIRD, 2025):

- Forrestfield D Range F2 phase (unit 213Fo_Ff2): Foot and low slopes < 10%. Well drained gravelly yellow or brown duplex soils with sandy topsoil. Woodland of *E. marginata*, *E. calophylla* and some *B. grandis*.
- Forrestfield F4 Phase (unit 213Fo_F4): Incised stream channels within gentle slopes with deep acidic yellow duplex soils and sandy alluvial gradational brown earths. This unit is aligned with Crystal Brook.
- Forrestdale (D Range) F1 Phase (unit 213Fo_Ff1): Foot and low slopes < 10% with deep rapidly drained siliceous yellow brown sands, and pale or bleached sands with yellow-brown subsoil. Shrubland of unidentified species.

Land degradation risk categories for each mapped unit are outlined below (Table 2-1). As noted below, the highest land degradation risk is wind erosion of the 213Fo_Ff1 unit, and flood hazard of the 213Fo_F4 unit (DPIRD, 2025).

Table 2-1: Land Degradation Risk Categories

Land Degradation Risk Category	213Fo_Ff2	213Fo_F4	213_Fo_Ff1
Water Erosion	0% of map unit has a very high to extreme hazard	60% of map unit has a very high to extreme hazard	0% of map unit has a very high to extreme hazard
Wind Erosion	10% of map unit has a high to extreme hazard	15% of map unit has a high to extreme hazard	100% of map unit has a high to extreme hazard
Flood Hazard	0% of the map unit has a moderate to high hazard	70% of the map unit has a moderate to high hazard	0% of map unit has a moderate to high hazard
Salinity Hazard	0% of map unit has a moderate hazard	0% of map unit has a moderate hazard	0% of map unit has a moderate hazard
Waterlogging and Inundation	0% of map unit has a moderate to very high risk	0% of map unit has a moderate to very high risk	0% of map unit has a moderate to very high risk

Source: DPIRD, 2024

2.4 Hydrology

2.4.1 Surface Water

Crystal Brook meanders through the management area, and ultimately drains offsite into the Yule Brook, which discharges into the Canning River (Landgate, 2025). Crystal Brook forms a gully and is approximately 1 to 2 m below ground level in the area in which it traverses the management area, flowing in an easterly direction towards Yule Brook for approximately eight months of the year (Strategen 2014). The 1% annual exceedance probability (AEP) floodplain area has not been mapped by DWER; however, given Crystal Brook is 1 to 2 m lower than the surrounding parts of the site, the floodplain of Crystal Brook is not anticipated to extend significantly into the management area (Strategen 2014).

Notably, where the vertical banks of the Crystal Brook form, the soils appear clayey in nature (predominantly in eastern portion of creekline), becoming flatter as soils are less clayey and have more structure (western portion of creekline) (Strategen, 2014).

2.4.2 Groundwater

The site is underlain by the Perth Superficial Swan aquifer, which overlays the Leederville and Yarragadee North aquifers (DWER 2025a). Based on a search of the DWER Water Register database, there is some groundwater available for allocation in the superficial aquifer within this subarea.

Galt Geotechnics (2021) noted that shallow perched groundwater may occur during winter.

The DWER 2019 regional groundwater mapping contours do not extend over this area (DWER 2025b); however, Strategen (2014) reported the Perth Groundwater Atlas (2nd edition, DoE 2004) mapped the minimum groundwater levels on site as ranging between 16 to 18 mAHD, which indicates a depth to groundwater of between 33 m in the southeast and 20 m in the northwest and flowing in a westerly direction (Strategen, 2014).

The site is not located within a Public Drinking Water Source Area (PDWSA) (DWER 2025b).

Crystal Brook and Yule Brook are noted to sit above the regional groundwater table. This indicates that the watercourses are 'losing streams', relying on water from higher elevated areas, being the Daring Scarp, and

which remain in situ due to the clayey sediments at their base limiting infiltration to the regional groundwater aquifer (Strategen, 2014).

Predevelopment groundwater monitoring was undertaken by Strategen as a part of the LWMS preparation and indicated that all measured levels of nutrients were within allowable Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines, except for total Ammonia as the Nitrogen values were recorded as slightly above guideline levels. This is attributed to historical use of the land (DEC, 2025).

2.5 Flora and Vegetation

2.5.1 Regional data

Regional scale mapping (Heddl et. al. 1980) indicates that remnant vegetation onsite forms part of the Forrestfield Vegetation Complex (Landgate, 2025). This complex is described as:

- Vegetation ranges from open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah) to open forest of *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri) - *Allocasuarina fraseriana* (Sheoak) - Banksia species. Fringing woodland of *Eucalyptus rudis* (Flooded Gum) in the gullies that dissect this landform.

The remaining extent of the Forrestfield Complex within the Swan Coastal Plain is 12.3%, and 11.4% within the City of Kalamunda (GoWA, 2019).

It is noted that limited remnant vegetation is present onsite. Historical aerial photography from the 1950s and 1960s shows the majority of the site was cleared of vegetation at this time (Landgate, 2025).

2.5.2 Previous surveys

In 2018, Western Botanical undertook a reconnaissance level flora and vegetation survey of the site (Appendix 2). The survey recorded eight vegetation units, with two units occurring in the management area (Table 2-2).

No Threatened or Priority species were identified across the site, and none are expected to occur, given most of the site is highly modified and completely degraded and/or degraded. Slashing has historically regularly been undertaken at the site to mitigate fire impacts, and there is no remnant vegetation within the management area.

Table 2-2: Vegetation units within the management area

Vegetation units	Example Site Photograph
Unit 5: <i>Corymbia calophylla</i> (<i>Eucalyptus rudis</i>) open woodland over degraded/cleared - Open woodland of <i>Corymbia calophylla</i> (<i>Eucalyptus rudis</i> variably present) over a historically cleared understorey. Condition: Degraded, Area: 2.91 ha	

Vegetation units	Example Site Photograph
Unit 7: <i>Corymbia calophylla</i> woodland over dense garden planting - <i>Corymbia calophylla</i> woodland over a dense tall understorey and ground layer of exotic plantings. A creek runs through a portion of the unit but is not associated with a separate vegetation unit. The Declared Pest <i>Zantedeschia aethiopica</i> (Arum Lilly) is present within this unit. Condition: Completely Degraded, Area: 1.51 ha	

Source: Western Botanical, 2018

However, given the extent of time that has passed since the 2018 survey, and the lack of native vegetation understorey within the site due to ongoing fire mitigation measures, PGV Environmental undertook an assessment in May 2024 which mapped the dominant tree types (native and non-native) within the management area, along with the following corresponding tree codes (PGV, 2025) (Figure 2):

- Non-native Trees
 - Ecam: *Eucalyptus camaldulensis* (River Red Gum)
 - Eg: *Eucalyptus grandis* (Rose gum)
- Native Trees
 - Cc: *Corymbia calophylla* (Marri)
 - Er: *Eucalyptus rudis* (Flooded Gum)

2.6 Fauna and Habitat

2.6.1 Previous Surveys

A level 1 vertebrate fauna and habitat assessment and targeted Carnaby's Black Cockatoo assessment was undertaken by Western Wildlife in 2018. The following presents the key findings reported by Western Wildlife (2018).

Fauna habitats observed in the management area were:

- Cleared areas with exotic trees
- Creek
- Remnant/regrowth Marri forest (mostly in association with the creek)

The identified habitats were lacking in native understory and generally degraded, but the canopy of Jarrah, Marri and Sheoak trees are likely to support some native fauna species. The creek is likely to provide a local ecological linkage across the southern part of the site. A total of 13 Jarrah, Marri or Flooded Gum trees were identified that demonstrated a diameter at breast height (DBH) equal to or greater than 50 cm (i.e., met the minimum size criteria to be considered potentially suitable for black cockatoo breeding) within the management area.

The only four conservation significant fauna identified as likely to use the management area on a regular basis are:

- Carnaby's Black-Cockatoo (*Zanda latirostris*) – Endangered (EPBC Act and BC Act)
- Baudin's Black-Cockatoo (*Zanda baudinii*) – Endangered (EPBC Act and BC Act)
- Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable (EPBC Act and BC Act)
- Quenda (*Isoodon fusciventer*) – DBCA Priority 4

2.6.2 2024 Black Cockatoo Foraging Habitat Assessment

In May 2024, PGV Environmental undertook a foraging habitat assessment for Carnaby's Black Cockatoo (*Zanda latirostris*), Baudin's Black Cockatoo (*Zanda baudinii*) and Forest Red Tailed Black Cockatoo (*Calyptorhynchus banksii naso*) within the site, inclusive of the management area. The assessment reviewed dominant tree types within the site and provided a broad-scale map summarising foraging habitat for Carnaby's Black Cockatoo, Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo. Broad tree types within the management area which represent black cockatoo foraging habitat are limited to the Marri (Cc) and associated tree mapping unit (PGV, 2025) (Figure 3; Figure 4).

2.7 Conservation Areas

The management area does not contain any Bush Forever (BF) areas, mapped ecological linkages or geomorphic wetlands (Landgate, 2025).

Part of the management area is mapped as being within an Environmentally Sensitive Area (ESA); however, upon closer inspection of the ESA mapping within the site it appears the ESA mapping within the northern portion of the site represents a buffer to a Threatened Ecological Community (TEC) located on the opposite side of Welshpool Road East and within BF site 50, as indicated within the BF Directory (DEP, 2000). As such, the actual boundary of the ESA would not extend into the management area as the ESA extent represents the TEC extent only.

2.8 Bushfire

The entire management area is mapped as being within a Bush Fire Prone Area (Landgate, 2025). These areas are defined as being subject to, or likely subject to bushfire attack and are identified by the presence of and proximity to bushfire prone vegetation and includes both the area containing the bushfire prone vegetation and a 100 m buffer zone immediately surrounding it.

As a part of the DA documentation package, updated Bushfire Attack Level contours and a Bushfire Management Plan has been prepared.

2.9 Heritage

The management area does not contain any known mapped European or Aboriginal heritage areas.

The broader site is adjacent to the City of Kalamunda's 'Avenue of Lemon Scented Gums', however this does not impede on the management area.

2.10 Adjacent Land Uses

The broader site is presently used for rural residential purposes, with the creekline being unmanaged and access unrestricted. Proposed development of the Providence Lifestyle Aged Care Facility would achieve a better environmental outcome for the Crystal Brook, than if it were to remain in its current state due to the implementation of this FMP and the development as a whole.



The proposed development is unlikely to result in detrimental effects on the Crystal Brook due to an increase in land use pressure, as the separation distance between the nearest dwelling and the management area is over 15 m.

3 Biophysical Assessment

3.1 Purpose

To identify the functional area of the foreshore reserve and watercourse, a biophysical assessment has been undertaken in line with the following documents:

- Operational Policy 4.3: Identifying and establishing waterways foreshore areas (DoW, 2012)
- Water Notes 23 (WN 23): Determining foreshore reserves (WRC, 2001)

3.2 Assessment

WRC's (2001) Water Note WN 23: Determining Foreshore Reserves list the biophysical criteria that form the physical and biological features of a waterway, and which are to be considered in defining the foreshore reserve. An assessment was undertaken against these biophysical criteria to determine the foreshore management area relevant to this FMP (Table 3-1).

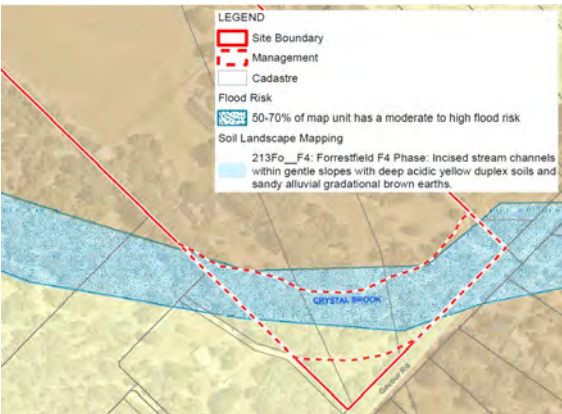
The biophysical assessment was informed by a targeted site visit by Coterra Environment scientists, desktop data assessment, as well as incorporation of relevant technical studies undertaken for the site. The Coterra Environment site inspection assessed the ground conditions and topographic elevations of the site nearby the creekline, as well as recording vegetated areas along the creekline. Track logs for the site inspection are provided below (Plate 3-1).

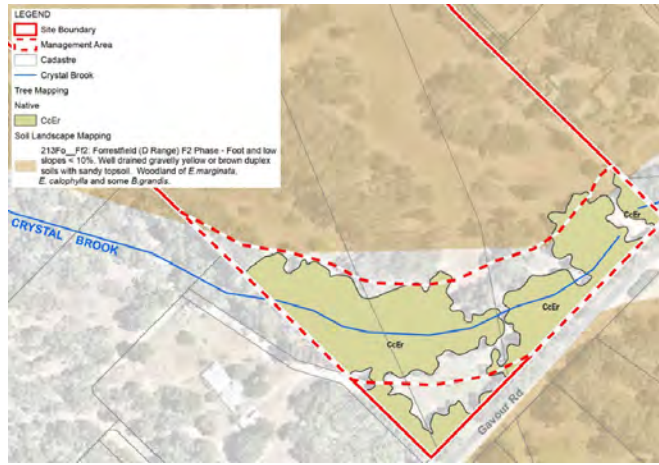
Example photographs and maps are provided against each relevant biophysical criteria, which showcase the on-ground conditions which led to the determination of the foreshore reserve (Plate 3-1).



Plate 3-1: Coterra Environment Site Inspection Track Log and Photo Points

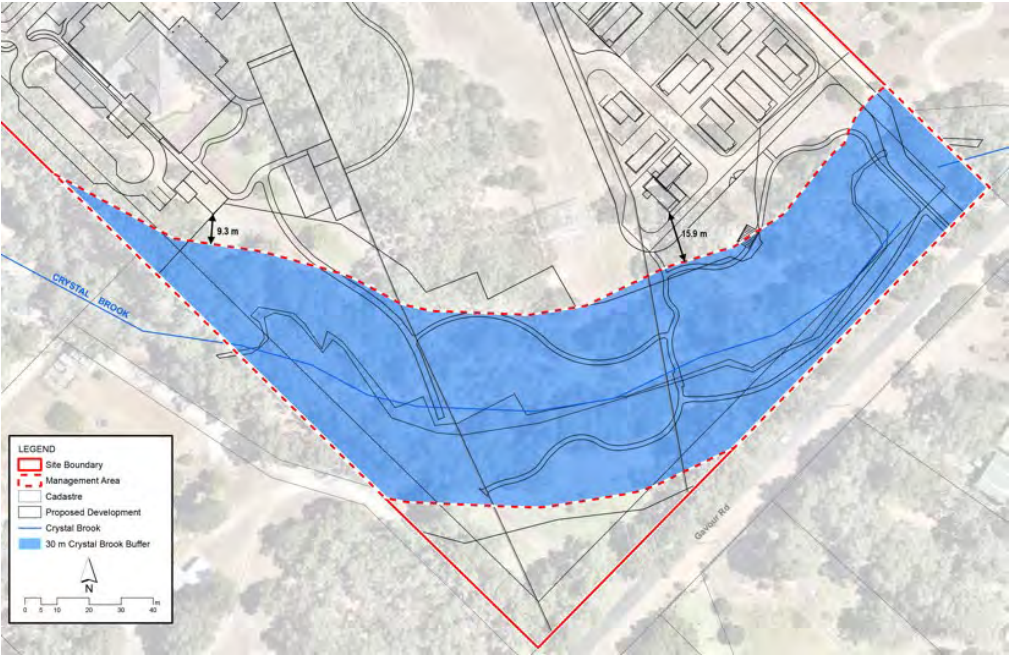
Table 3-1: Biophysical Criteria and Assessment

Biophysical Criteria	Description	Site Assessment and Example Characteristic Photograph and/or Mapping
Vegetation	Fringing and upland vegetation associated with, or influencing, the waterway.	Vegetation within the site consist of a mix of planted and naturally generated endemic and non-endemic species. Relevant considerations to determining the extent of the management area included the extent of <i>Corymbia calophylla</i> (marri), <i>Eucalyptus rudis</i> (flooded gum) and <i>Melaleuca</i> spp. growing in association with the Crystal Brook and foreshore area, as these species are known to grow in association with wetlands and drainage lines (Figure 2). Of note, <i>E. rudis</i> is not mapped as a dominant tree type in any other location within the site other than within the management area. At least 41 weeds occur within the foreshore area, and there is no distinct pattern of these species that delineate the creekline or management area, reflective of the site's current land use and associated landscaping (Table 4-2).  Plate 3-2: <i>Eucalyptus rudis</i> along creekline
Hydrology	Flood prone land and areas subject to waterway channel changes.	The DPIRD maps the adjacent soils to the Crystal Brook as being part of the Forrestfield F4 Phase, described as (DPIRD, 2025; Figure 5): Forrestfield F4 Phase (unit 213Fo_F4): Incised stream channels within gentle slopes with deep acidic yellow duplex soils and sandy alluvial gradational brown earths. This soil map unit (mapped in approximate correlation with the Crystal Brook alignment) is considered to have 70% of the map unit as having a moderate to high hazard (DPIRD, 2025). The site is not mapped as containing any floodplain areas.  Plate 3-3: Soil Units, Flood Hazard Mapping and Management Area

Biophysical Criteria	Description	Site Assessment and Example Characteristic Photograph and/or Mapping	
Soil Type	Soil types that define extent of foreshore vegetation.	The vegetation mapped in the 'CcEr' tree unit is in approximate correlation with the Forrestfield F4 Phase, and does not occur elsewhere on site (DPIRD, 2025). It is noted that the DPIRD mapping is broad scale and boundaries may vary on-ground.  Plate 3-4: Example of CcEr Vegetation Unit	 Plate 3-5: CcEr Vegetation Unit and Forrestfield F4 Phase Mapping
Erosion	Soil types prone to erosion.	The DPIRD maps Forrestfield F4 Phase as containing 60% of the map unit has a very high to extreme water erosion hazard (DPIRD, 2025). Other soils on site (Forrestfield D Range F2 phase and Forrestdale (D Range) F1 Phase) both have 0% of the map unit with a very high to extreme water erosion hazard (DPIRD, 2025).  Plate 3-6: Erosion occurring within Forrestfield F4 Phase	
Geology	Geological features that	The urban geology of the site is broadly mapped and not indicative of the waterway and management area, or the Crystal Brook. The site's broad scale geological features are therefore not a determining factor of the management area.	

Biophysical Criteria	Description	Site Assessment and Example Characteristic Photograph and/or Mapping
	influence the waterway.	
Topography	Landscape features including slope, shape and composition of the landforms that influence, or are influenced by the waterway.	Notable site topographic features that were considered when defining the management area include: - Existing waterway is defined by an incised channel that is approximately 1 to 2 m below ground level - Beyond the defined channel, topography is generally broad and flat and not indicative of a defined floodplain area - Some discrete areas sloped down towards the waterway and could indicate the foreshore boundary. These areas are all captured within the 30 m management area    Plate 3-7: Deeper Point in channel Plate 3-8: Shallower Point in channel Plate 3-9: Example Sloping Landscape
Function	The foreshore function, i.e., flood protection, recreation or habitat conservation.	The function of the management area would serve to both conserve the Crystal Brook waterway, as well as provide a passive recreational space for the proposed development. The tree canopy in this location provides excellent shade opportunities. Defining the management area will assist with preserving the habitat in this area for conservation significant fauna such as large trees for black cockatoos, or low shrubs for Quenda, where practical.  Plate 3-10: Tree Canopy along the Creekline

Biophysical Criteria	Description	Site Assessment and Example Characteristic Photograph and/or Mapping
Habitat	Habitats such as river pools, woody debris, riffles and riparian vegetation.	The following habitat has been identified within the management area: • Limited aquatic habitat, due to creekline being highly modified from its original condition, for creekline species such as frogs • Dense fringing vegetation (grasses and shrubs) that provide habitat for bandicoots • Large trees which provide habitats for birds, notably black cockatoos • No other conservation significant fauna are expected to occur within the site • Fallen logs and litter possibly provide fauna habitat The vegetation associated with the waterway may provide a corridor for fauna movement between adjacent vegetated areas of habitat value.    Plate 3-11: Potential Quenda Habitat Plate 3-12: Marri trees – Black Cockatoo Habitat Plate 3-13: Dead logs – Potential Habitat
Climate	Climatic variations and resultant changes in water levels.	Crystal Brook is mapped by DWER as being a watercourse that is minor and non-perennial, which may be dry for much of the time, with flows being seasonal or intermittent and responsive to rainfall, and considered susceptible to climate variations and water levels. This was confirmed during the Coterra site inspection, undertaken in summer, which noted that the creek was dry.   Plate 3-14: : Dry Creekline (Eastern Portion) Plate 3-15: Dry Creekline (Western Portion)

Biophysical Criteria	Description	Site Assessment and Example Characteristic Photograph and/or Mapping
Land Use	Areas that may be harmed by increased land use pressure.	Majority of the proposed development has been sited within the cleared areas of the site. The proposed development is set back by a distance at least 15 m from the mapped waterway, which will ensure the increase in land use pressure does not cause harm to the waterway.  LEGEND - Site Boundary - Management Area - Cadastral - Proposed Development - Crystal Brook 30 m Crystal Brook Buffer Plate 3-16: Setback Distances
Heritage	Archaeological and ethnographic sites.	The site does not contain any known heritage sites

Source: All above photographs were taken by Coterra Environment during site inspections on either 11 November 2024, or 3 January 2025.

3.3 Management Area Determination

Based on the outcomes of the biophysical assessment (refer Table 3-1), and the following biophysical attributes, a 30 buffer distance is proposed which includes:

- Extent of riparian vegetation located in proximity to the Crystal Brook creekline, notably where *Eucalyptus rudis* is mapped as a dominant tree type
- Majority of the mapped extent of the Forrestfield F4 Phase and its associated characteristics (e.g., flood hazard, erosion hazard) in comparison to the other soils mapped on site
- Areas where topography is indicative of a sloping creek bank.

Considering the highly modified and degraded condition of the foreshore, and lack of native riparian vegetation along most parts of the waterway, a 30 m buffer distance to the mapped watercourse is considered to be appropriate and has been used to generally inform the boundary and extent of the management area under this FMP (Figure 6).



4 Foreshore Management Plan

4.1 Purpose of Plan

As an outcome of the biophysical assessment for the Crystal Brook, this FMP has been prepared to address the following objectives, relevant to the foreshore management area and Crystal Brook creekline:

1. Protect and enhance the natural aspects of the Crystal Brook and associated fringing vegetation
2. Design an open space which is functional for recreation, maintains its aesthetic value and does not impact on the Crystal Brook
3. Support regeneration of native riparian vegetation and subsequently the Crystal Brook through targeted weed control and access management
4. Ensure the development sets out to retain fauna habitat opportunities and pertinent vegetation within the management area where possible
5. Ensure no adverse impacts to the Crystal Brook's function, water quality or downstream environment occur as a result of the development.

4.2 Key Environmental Matters

The following key environmental matters have been considered during the preparation of this FMP:

- Vegetation and fauna habitat impacts
- Erosion and hydrological regime changes
- Access management and inappropriate recreational uses
- Bushfire hazard
- Construction management.

4.3 Overview of Management Actions, Timing and Responsibilities

To address the above environmental issues, the below implementation table has been prepared and should be adhered to by all site workers/contractors where relevant (Table 4-1).

Primary management actions identified include:

- Weed control
- Maintenance of selective existing vegetation where it provides fauna habitat, foreshore stabilisation or aesthetic value
- Landscaping works.

It is noted that the management area will remain under the ownership, care and maintenance of Providence Lifestyle as it is not being created as Public Open Space reserve, but rather a conservation/passive recreation area within the site. Future management responsibilities will not fall to the City of Kalamunda and will remain the care and responsibility of Providence Lifestyle.

Table 4-1: Implementation Schedule

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
Aboriginal Heritage Sites	To protect any Aboriginal heritage values.	There are no known Aboriginal Heritage sites within the management area. Prior to any works commencing in the management area, all contractors will be made aware of their obligations under the <i>Aboriginal Heritage Act</i> (1976). Should any unexpected heritage finds occur, the following protocol will be undertaken: 1. Cease all works in the immediate area 2. Fence or flag the potential heritage area to avoid any further intrusion 3. Contractor to advise project superintendent/Providence Lifestyle representative who will contact the Department of Planning, Lands and Heritage and follow instructions provided.	✓	✓	✓	All personnel entering the site.
Drainage	Ensure no additional drainage occurs from onsite areas into Crystal Brook.	The development considers environmentally sensitive design whereby no changes to the hydrological regime of the Crystal Brook (such as crossings which inhibit water flow) are proposed.	✓	✓	✓	All site work must adhere to approved drainage designs and management plans.
Stormwater Disposal	Implement the drainage strategy as outlined within the Drainage Management Plan prepared for the development and approved by the City of Kalamunda.	No surface drainage is proposed into the Crystal Brook. All stormwater will be held in detention basins prior to infiltration to the underlying groundwater. Swales will be installed throughout the site in conjunction with below ground storage to provide infiltration opportunities prior to overflow to the main basin.				
Mosquitos and Midge		A drainage basin will be constructed in the northern boundary of the site where stormwater will be disposed of via infiltration, ensuring on-site infiltration of all stormwater (including the 1% annual exceedance probability). Bio-retention will be implemented throughout the development's swales and detention basin. All subsoil drainage will be designed consistent with <i>Water Resource Considerations when Controlling Groundwater Levels in Urban Development</i> (DoW, 2013).				

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
Erosion	To reduce risk of erosion of the waterway and foreshore area.	To ensure no erosion occurs as a result of the development, the following will be implemented: • Portions of the Crystal Brook banks which exhibit signs of erosion that require stabilisation will be identified prior to site works commencing within 50m of the watercourse to ensure no additional erosion in these areas occurs • Weed control will be undertaken in a manner that reduces the risk of erosion to creek banks (e.g., targeting grass weeds over larger plants which may presently stabilise banks) (see Section 4.5) • Large plants and trees which provide both aesthetic and functional value to the creekline will not be removed, unless identified as impacting on foreshore maintenance (see Section 4.5) • If erosion is identified as potentially occurring after weed control has been undertaken, soft engineering techniques such as hemp matting will be implemented whilst vegetation regrows (see Section 4.5) • No in-stream planting will occur (see Section 4.5.2) • Fallen logs that are greater than 150 mm in size will be retained, where bank stability will be compromised if removed (see Section 4.5)	✓	✓	✓	All site work must adhere to approved engineering and landscape designs.
Fauna and Habitat	To protect any fauna habitat present within and adjacent to the waterway and foreshore area.	Fauna habitat within the creekline and foreshore areas for conservation significant fauna includes: • Large trees which provide potential foraging, potential roosting and potential future nesting habitat for three south-west species of Black Cockatoos • Shrubbery which provides potential movement corridors and foraging habitat for Quenda. To ensure protection of this vegetation, the following will occur: • Delineation/flagging of any vegetation proposed for retention to ensure no impacts occur	✓	✓	✓	All site work must adhere to approved engineering and landscape designs and management methods.

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
		- Minimal removal of large shrubs and trees within the management area (see Section 4.5) - Vegetation management will consist of weed control in accordance with Section 4.6 - Additional landscaping (including planting works) will ensure controlled access into the management area, reducing damage to potential fauna habitat (see Section 4.5).				
Bushfire	Reduce the likelihood of bushfire impacts.	The development is subject to a Bushfire Management Plan (BMP) which will be adhered to through the project's lifespan (and updated when required).	✓	✓	✓	All contractors to adhere to requirements. Proponent responsible for BMP implementation post-development.
Flooding	Ensure vegetation planting is able to withstand flooding. Ensure no changes to the hydrological regime of Crystal Brook occur.	Revegetation species have been selected based on suitability to the environment in which they are being planted (i.e., resistant to occasional inundation, foreshore stabilisation etc.), in combination with aesthetic value and environment suitability (e.g., native species nearest to the creekline, non-native species further back from creekline to reduce potential spread into unwanted areas downstream) (see Section 4.5.2). No changes to the hydrological regime are expected to occur as a result of vegetation planting.	✓	✓	✓	Project landscape architects (pre-development). Proponent to be responsible for ongoing management and maintenance.
Foreshore Vegetation	To enhance and maintain native riparian	Native riparian vegetation within the foreshore area is largely limited to mature trees (e.g., <i>Eucalyptus</i> spp., <i>Melaleuca</i> spp.). Enhancement of riparian vegetation will occur through:	✓	✓	✓	Project landscape

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
	vegetation within the foreshore area.	- Targeted weed control (see Section 4.5) - Targeted landscape planting of identified species (see Section 4.5.2) - Controlled access through the management area (see Section 4.7).				architects (pre-development). Proponent to be responsible for ongoing management and maintenance.
European Heritage Values	To protect European heritage values at local and regional scales.	No European heritage values are known within the site (see Section 2.9). Should any unexpected heritage finds occur, the following protocol will be undertaken: - Cease all works in the immediate area - Fence or flag the potential heritage area to avoid any further intrusion - Contractor to advise project superintendent/Providence Lifestyle representative who will contact the Department of Planning, Lands and Heritage and follow instructions provided.	✓	✓	✓	All personnel entering the site.
Land Tenure	To ensure protection and maintenance of the foreshore area under its current tenure.	The site and foreshore management area will remain in private ownership and the responsibility for maintenance and management will remain with the proponent.	-	-	-	Landowner.
Nutrient Export	Nutrient export should not occur from the site into the foreshore area/waterway.	Groundwater quality and nutrient export will be managed through: - Connection of dwelling and community buildings onsite to the reticulated sewer network to avoid the need for onsite effluent disposal - Bioretention basins will be vegetated to enable nutrient uptake, and will undertake regular inspection and maintenance events (tri-annually), including sediment removal, weed control/removal, infill planting, rubbish collection, removal of dead plants and any additional remediation required	✓	✓	✓	Project landscape architects (pre-development). Proponent to be responsible for ongoing management.

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
		- Limiting the use of fertiliser within areas irrigated with treated wastewater adjacent to the management area - Education of local residents within the village and maintenance personnel - The use of detention basins to hold stormwater prior to infiltration on site. - No surface drainage will enter the Crystal Brook				
Access	Public access into defined nodes within the foreshore area should occur, with restrictions to identified protected areas.	As a part of the sites detailed landscaping works, access into the management area will be facilitated through the existing red asphalt driveway and bridge across the Cystal brook Creek. The site is proposed to be securely gated, whereby public access is limited to authorised personnel and resident visitors/guests only. Further, the management area will only be frequented by residents and their guests, who will have a vested interest in maintaining the management area. The primary accessway for vehicles/site entry is located at the northern end of the site and does not enter the management area. A secondary accessway is provided off Gavour Road, which utilises the current access point/ creekline crossing in this location and is proposed to be gated to prevent public access. The current fencing present along the Gavour Road boundary will be maintained to prevent public access once the site is developed. No changes to the on-ground structures and condition within the management area are proposed to facilitate access to the site.	✓	✓	✓	Project landscape architects (pre-development). Proponent to be responsible for ongoing management.
Recreation	Recreation should aim to harmonise the local environment and not affect the sensitive environment of the waterway or foreshore area.	The proposed development will enhance the current passive recreational values of the Crystal Brook by: - Providing 'Pocket Parks' with seating nodes, picnic tables and/or benches at strategic locations - Ensuring access is controlled and limited to select areas of the creekline - Encouraging recreation to be undertaken at dedicated facilities (e.g., pickleball courts, lawn bowls club), by encouraging people to use these recreation nodes instead of allowing the entirety of the management area to serve as recreational areas	✓	✓	✓	Project landscape architects (pre-development). Proponent to be responsible for ongoing management.

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
Reserve Boundaries	Physical definition of the reserve area should be undertaken, and boundaries (fencing) should be implemented if appropriate.	As the entire development will be securely fenced, and the only public access will be by people who reside within the development and therefore have a vested interest in maintaining the management area, no fencing around the management area is proposed. The boundary to Gavour Road is proposed to maintain the current fencing, and public access will be controlled by the installation of controlled gates. See Section 4.7.	✓	✓	✓	All personnel undertaking works on site.
Soil Types	Soil types should be determined to establish suitable management objectives.	Soil types and soil properties within the management area are known given available regional mapping and site specific geotechnical works that have been undertaken. The site comprises (Jordan, 1986): - Gravelly Silt (Mgs2) - strong brown, tough, common pebbles of fine to coarse grained, subrounded granite, some dolerite and rare sandstone, variable sand content - Sand (S12) - structureless, yellow, fine-grained, subangular and medium to coarse grained subrounded to rounded quartz, feldspar and heavy minerals common, minor silt and clay As such, proposed management has been considerate of the suitability of these soils to withstand proposed management objectives.	✓	-	-	Appropriate investigations have occurred to address this factor.
Utility Services	Appropriate implementation of utility services as to not affect the waterway or foreshore reserve area.	The site will be connected to all services either by extension and upgrading existing infrastructure or by extension of infrastructure to service the site. Each allotment within the development will be connected to standard Water Corporation reticulated sewers. The site will be serviced by a wastewater pumping station that will be located within the POS abutting Welshpool Road (i.e., outside of the management area).	✓	✓	✓	Engineering design to reflect utility and service requirements. Proponent to be responsible for ongoing management.

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
Water Features	Ensure any water features align with the management objectives of this plan.	No water features are proposed so as to not disrupt the current hydrological regime of Crystal Brook.	-	-	-	-
Water Quality	Ensure no changes to water quality occur.	To ensure no changes to water quality occur, the following key factors and management items have been identified (DWER, 2023): - Eutrophication: Ensure any fertiliser application within the site is targeted and does not impede within the management area. - Erosion and sedimentation: Ensure land use and management practices are appropriately planned. Ensure no riparian vegetation which plays a critical role in stabilising the Crystal Brook banks. - Acid sulphate soils: Should dewatering be required for the site the potential for disturbance for ASS should be investigated and management actions put in place, if required. - Non-nutrient contaminants: Potential non-nutrient contaminants which could occur in the management area include metals, pesticides, bacteria and nutrients. To ensure these contaminants do not affect water quality, no works which have the potential to result in contamination will occur within the management area. - Salinity: It is unlikely that salinity will affect water quality within the site. No large trees will be removed. Refer to Section 4.5 for details on weed control and water quality.	✓	✓	✓	All personnel undertaking works on site. Proponent to be responsible for ongoing management.
Weeds	Ensure environmentally safe and practical weed management protocols are implemented.	Refer to Sections 4.5 and 4.6.	✓	✓	✓	Refer to Section 4.5.

Key Factor	Management Objectives	Key Management Actions	Timing (construction phases)			Applicability / Responsibility
			Pre	During	Post	
Feral Animal Control	Where feral animals are deemed an issue to waterway and foreshore management, undertake works to mitigate impacts.	Feral animals are not considered to be an issue for foreshore management. However, to mitigate potential impacts of grazing of tubestock from feral animals, tree guards will be utilised when planting works occur.	-	-	-	Should feral animals become relevant during later stages of the project, site personnel will act under the direction of the site supervisor and proponent.

4.4 Management Area Design Overview

The Landscape Concept Plan identifies the following outcomes for the management area (Appendix 3):

- Rehabilitation and enhancement of Crystal brook and associated buffer
- Weed treatment to remove problematic and invasive species
- Retention of existing non-invasive exotic plant species
- Revegetation and infill planting utilising locally endemic species over a three year period (non-irrigated winter planting).

4.5 Vegetation Management

4.5.1 Native Vegetation Retention

The Landscape Concept Plan looks to retain as much native vegetation within the management area as possible. Native vegetation will only be removed if it poses a hazard or is in an area designated for recreational structures (e.g., park benches) (Appendix 3).

4.5.2 Planting

Planting within the management area will consist of locally endemic and non-invasive species. Plantings will occur over three years during winter (and therefore will not be irrigated). The species proposed to be planted (subject to further refinement) include:

Bushland Revegetation Planting

- | | | |
|-----------------------------------|-------------------------------|----------------------------------|
| ▪ <i>Acacia lasiocarpa</i> | ▪ <i>Beaufortia elegans</i> | ▪ <i>Grevillea thelemanniana</i> |
| ▪ <i>Allocasuarina fraseriana</i> | ▪ <i>Beaufortia squarrosa</i> | ▪ <i>Hakea lissocarpa</i> |
| ▪ <i>Astraea scoparia</i> | ▪ <i>Bossiaea eriocarpa</i> | ▪ <i>Hemiandra pungens</i> |
| ▪ <i>Banksia attenuata</i> | ▪ <i>Chorizema cordatum</i> | ▪ <i>Hibbertia hypercoides</i> |
| ▪ <i>Banksia grandis</i> | ▪ <i>Corymbia calophylla</i> | ▪ <i>Eucalyptus marginata</i> |
| ▪ <i>Banksia nivea</i> | ▪ <i>Dampiera linearis</i> | ▪ <i>Melaleuca trichophylla</i> |
| ▪ <i>Banksia sessilis</i> | ▪ <i>Eucalyptus tottiana</i> | ▪ <i>Regelia ciliata</i> |

Creekline and Drainage Basin Planting

- | | | |
|------------------------------------|-------------------------------------|---------------------------------|
| ▪ <i>Acacia pulchella</i> | ▪ <i>Juncus pallidus</i> | ▪ <i>Melaleuca lateritia</i> |
| ▪ <i>Baumea juncea</i> | ▪ <i>Juncus subscendus</i> | ▪ <i>Melaleuca preissiana</i> |
| ▪ <i>Bolboschoenus caldwellii</i> | ▪ <i>Kunzea glabrescens</i> | ▪ <i>Melaleuca raphiophylla</i> |
| ▪ <i>Eucalyptus rudis</i> | ▪ <i>Lepidosperma longitudinale</i> | ▪ <i>Melaleuca viminea</i> |
| ▪ <i>Hibbertia hypercoides</i> | ▪ <i>Leptocarpus scariosus</i> | ▪ <i>Pericalymma ellipticum</i> |
| ▪ <i>Hypocalymma angustifolium</i> | ▪ <i>Lobelia anceps</i> | ▪ <i>Regelia ciliata</i> |
| ▪ <i>Jacksonia sternbergiana</i> | ▪ <i>Melaleuca incana</i> | ▪ <i>Taxandria linearifolia</i> |

4.6 Weed Control and Management

Targeted weed control will occur in accordance with the below (Table 4-2).

Weed control will be subject to on-ground conditions, and will be dependent on future landscaping works proposed for the development.

Given the extent of weeds and exotic plants within the waterway, and that Crystal Brook is a tributary of Yule Brook, the following will be considered when planning any weed control works within the management area:

1. Any vegetation removal is not to result in erosion or destabilisation occurring
2. No adverse impacts to the Crystal Brook to occur as a result of management practices being implemented (e.g., using herbicides within the creekline), and what management practices are most appropriate given proximity to the creekline.
3. The proposed weed control technique provides a sustainable outcome (i.e., will treatment be ongoing)
4. If exotic plants are not considered to be invasive, removal is not necessarily required.

4.6.1 Overall Weed Presence and Management Strategies

The flora and vegetation surveys undertaken within the site have identified at least 41 weed species to be present within Lot 500. These species and their recommended weed control methods are summarised in Table 4-2.

It is noted the development within the site will result in removal of much of the areas where weeds are currently present. Weed control works will therefore be focused within the management area and landscaped portions of the site.

Invasiveness key:

High
Medium
Low

Table 4-2: Weed Control

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Woody Weeds															
<i>Acacia baileyana</i> (Cootamundra wattle)	Yes	- Cut close to ground level. - Paint cut stump immediately with 100% glyphosate. - Chip onsite and retain wood chips.	Year round. If retaining mulch after control has occurred, avoid Oct to Dec as seeds present.	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X
<i>Acacia iteaphylla</i> (Flinders Range Wattle)	Yes	- Cut close to ground level. - Paint cut stump immediately with 100% glyphosate. - Chip onsite and retain wood chips.	Year round. If retaining mulch, avoid July to December as there will be seed present.	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X
<i>Acacia longifolia</i> (Sydney Golden Wattle)	Yes	- Cut close to ground level - Chip onsite and retain woodchips	Year round. If retaining mulch, avoid October to December as there will be seed present.	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X
<i>Archontophoenix cunninghamiana</i> (Bangalow Palm)	No	If control is desired, cut close to ground level	n	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Paint stump with 100% glyphosate													
<i>Arundo donax</i> (Giant Reed)	Yes	- Spray all leaves with 5% glyphosate and adjuvant - Once dead, brush and remove biomass - Follow up spraying is required.	Spraying in February or March is essential for effectiveness, outside of these times spraying is ineffective. Recommend initial spray early February. Wait one month until dead. Follow up spray of regrowth at end of March. Spray regrowth in subsequent seasons.	X	✓	✓	X	X	X	X	X	X	X	X	X
<i>Bougainvillea glabra</i> (Bougainvillea)	Yes	- Cut back to ground level and dispose of biomass. - Paint stumps immediately after cutting with 100% glyphosate. - Spray any resprouts with 2% glyphosate, 10g/100L metsuluron, adjuvant.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Camelia oleifera</i> (Camelia)	Yes	- Cut to ground level and dispose of biomass. - Paint stumps immediately after cutting with 100% glyphosate.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Coprosma repens</i> (Mirror Bush)	Yes	Cut to ground level and dispose of biomass.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		Paint stumps immediately after cutting with 100% glyphosate.													
<i>Corymbia citriodora</i> (Lemon Scented Gum)	Yes seedlings/ saplings only.	- Hand pull seedlings. - Seedlings may also be sprayed with glyphosate during general weed control. - Cut saplings to ground level. - Paint stump with 100% glyphosate immediately after cutting.	Large trees can remain, note that they will continue to produce seed and seedlings will continue to germinate and require management. If it is preferred that the large trees are removed, cut to ground level, paint stump immediately with 100% glyphosate. Biomass can be chipped with mulch retained for use onsite.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Chamaecytisus palmensis</i> (tagasaste)	Yes	- Hand pull seedlings. - Seedlings may also be sprayed with glyphosate during general weed control. - Cut saplings to ground level and chip. - Paint stump with 100% glyphosate immediately after cutting.	Can be controlled year round. If retaining mulch for use onsite, mature plants should be chipped between April and August to prevent spreading seed*	X*	X*	X*	✓	✓	✓	✓	X*	X*	X*	X*	X*
<i>Eriobotrya japonica</i> (Loquat)	Yes	Cut to ground level and chip.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		- Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.													
<i>Erythrina sp.</i> (Coral Tree)	Yes	- Cut to ground level and chip. - Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Eucalyptus camaldulensis</i> (River Red Gum)	Yes Seedlings/ Saplings only	- Hand pull seedlings. - Seedlings may also be sprayed with glyphosate during general weed control. - Cut saplings to ground level. - Paint stump with 100% glyphosate immediately after cutting.	Large trees can remain, note that they will continue to produce seed and seedlings will continue to germinate and require management. If it is preferred that the large trees are removed, cut to ground level, paint stump immediately with 100% glyphosate. Biomass can be chipped with mulch retained for use onsite.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Eucalyptus resinifera</i> (Red Mahogany)	Non-essential due to low invasiveness.	- If control desired cut close to ground level. - Paint stump with 100% glyphosate immediately after cutting.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Ficus carica</i> (Edible Fig)	Yes	- Cut to ground level and chip - Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.	PPE required when cutting and chipping due to alkaline sap that will irritate skin and eyes.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Fraxinus sp</i> (Ash)	Yes	- Cut to ground level and chip. - Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.	Deciduous – control when growing.	✓	✓	X	X	X	X	X	X	✓	✓	✓	✓
<i>Melaleuca viminalis</i> (Bottlebrush)	Yes	- Cut to ground level and chip. - Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Nerium oleander</i> (Oleander)	Yes	- Cut to ground level. - Paint stump with 100% glyphosate immediately after cutting. - Remove biomass from site.	Oleander is toxic, sap will cause skin, eye and respiratory irritation. Wear appropriate PPE when cutting and do not chip or burn. Remove biomass from site.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Olea europaea</i> (Olive)	Yes	Cut to ground level and chip.		✓	✓	✓	✓	✓	✓	X	X	X	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		- Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.													
<i>Schinus terebinthifolius</i> (Brazilian Pepper)	Yes	- Cut to ground level and chip. - Paint stump with 100% glyphosate immediately after cutting. - Mulch can be retained for use onsite.		✓	✓	✓	✓	✓	✓	X	X	X	✓	✓	✓
<i>Strelitzia nicolai</i> (Giant White Bird of Paradise)	Control not essential due to low invasiveness. Could remain onsite as a feature plant.														
<i>Syagrus romanzoffiana</i> (Cocos Palm)	Yes Seedlings/ Saplings only	- Hand pull seedlings. - Seedlings may also be sprayed with glyphosate during general weed control. - Cut saplings to ground level. - Paint stump with 100% glyphosate immediately after cutting.	Large trees can remain, note that they will continue to produce seed and seedlings will continue to germinate and require management. If it is preferred that the large trees are removed, cut to ground level, paint stump immediately with 100%	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			glyphosate. Remove biomass from site.												
<i>Viburnum tinus</i> (Laurustinus)	Yes	- Cut to ground level - Paint stump with 100% glyphosate immediately after cutting. - Remove biomass from site.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Washingtonia filifera</i> (California Fan Palm)	Yes seedlings/saplings	- Hand pull seedlings. - Seedlings may also be sprayed with glyphosate during general weed control. - Cut saplings to ground level. - Paint stump with 100% glyphosate immediately after cutting.	Large trees can remain, note that they will continue to produce seed and seedlings will continue to germinate and require management. If it is preferred that the large trees are removed, cut to ground level, paint stump immediately with 100% glyphosate. Remove biomass from site.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Grass Weeds															
<i>Avena fatua</i> (Wild Oats)	Yes	Use Fusilade mixed at 1.3%, Brushwet 200ml/100L to spray when actively growing in July and Spray prior to flowering August		X	X	X	X	X	X	✓	✓	✓	✓	✓	✓
<i>Briza maxima</i> (Blowfly Grass)	Yes	For selective control use Fusilade mixed at 1.3%, Brushwet 200ml/100L to	Spray Prior to flowering	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
		spray when actively growing in July and August. Can also be treated during general weed control using glyphosate.													
<i>Ehrharta calycina</i> (Perennial veldt grass)	Yes	- For selective control use Fusilade mixed at 1.3%, Brushwet 200ml/100L to spray when actively growing in July and August. - Can also be treated during general weed control using glyphosate.	Spray Prior to flowering	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓
<i>Ehrharta longiflora</i> (Annual Veldt Grass)	Yes														
<i>Eragrostis curvula</i> (African Love Grass)	Yes	Use glyphosate mixed at 2%, Brushwet 200ml/100L	Resilient to fusillade.	✓	✓	✓	✓	X	X	X	X	X	X	X	✓
<i>Paspalum dilatatum</i> (Paspalum)	Yes	- For selective control use Fusilade mixed at 1.6%, Brushwet 200ml/100L to spray when actively growing in July and August. - Can also be treated during general weed control using glyphosate.	Do not spray Fusilade over water if Paspalum is growing in stream. Use glyphosate biactive.	✓	✓	✓	✓	X	X	X	X	X	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Pennisetum clandestinum</i> (Kikuyu)	Yes	- For selective control use Fusilade mixed at 1.3%, Brushwet 200ml/100L. - Can also be treated during general weed control using glyphosate.	Do not spray Fusilade over water if Paspalum is growing in stream. Use glyphosate biactive.	✓	✓	✓	✓	X	X	X	X	X	X	✓	✓
General Broadleaf Weeds															
<i>Fumaria capreolata</i> (Fumitory)	Yes	Use glyphosate mixed at 1.3%, Brushwet 200ml/100L to spray weeds to prevent seed set.	Spray when seedlings are small to prevent growth over revegetation.	X	X	X	X	✓	✓	✓	✓	✓	X	X	X
General Broad Leaf Weeds	Yes Various invasiveness.	Use glyphosate mixed at 1.3%, Brushwet 200ml/100L to spray weeds to prevent seed set.	Weeds can be sprayed year round with a focus on late autumn, winter and spring. Some hand weeding may be required around revegetation to avoid off target damage and ensure thorough weed control.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Geophyte Weeds															
<i>Clivia nobilis</i> (Natal Lily)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Spray at the same time as arum lily and Watsonia.	X	X	X	X	X	X	X	X	✓	X	X	X
<i>Freesia alba</i> × <i>leichtlinii</i> (Freesia)	Yes	Use metsulfuron at 2g/100L, Brushwet 200ml/100L.	Spray at flowering. Will require retreatment for several seasons.	X	X	X	X	X	X	X	✓	X	X	X	X

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Agapanthus praecox</i> (Agapanthus)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Spray just prior to flowering.	X	X	X	X	X	X	X	X	✓	X	X	X
<i>Zantedeschia aethiopica</i> (Arum Lily) Declared Pest – s22(2) (Exempt)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Spray at flowering. Will require retreatment for several seasons.	X	X	X	X	X	X	X	X	✓	X	X	X
<i>Watsonia meriana</i> (Watsonia)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Spray at flowering. Spray at same time as arum lily. Majority of control will occur in first season, with some follow up control required in subsequent seasons.	X	X	X	X	X	X	X	X	✓	X	X	X
Vine Weeds															
<i>Hedera helix</i> (English Ivy)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Where growing into canopy cut vines at head height and drop lower section to ground. Spray vines on ground. Biomass in canopy can remain in canopy to die off.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
<i>Ipomoea indica</i> (Morning Glory)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Where growing into canopy cut vines at head height and drop lower section to ground. Spray vines on ground. Biomass in canopy can remain in canopy to die off.	✓	✓	✓	✓	X	X	X	✓	✓	✓	✓	✓

Species (Common Name)	Control/ Invasiveness	Treatment Method	Additional Notes	Weed Control Timing											
				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Pandorea jasminoides</i> (Bower Vine)	Yes	Use glyphosate mixed at 2%, metsulfuron 10g/100L, Brushwet 200ml/100L	Where growing into canopy cut vines at head height and drop lower section to ground. Spray vines on ground. Biomass in canopy can remain in canopy to die off. Following treatment dead biomass can be brushcut and left to decompose.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

4.6.2 Targeted *Zantedeschia aethiopica* (Arum Lily) Control

As identified in Table 4-2, *Zantedeschia aethiopica* (Arum Lily) is a declared pest in Western Australia under the *Biosecurity and Agriculture Management Regulations 2013* (s22(2)) and therefore, considered the highest priority weed for control (DPIRD, 2020). The remainder of the weeds identified on site fall under the S(11) – Permitted category for management.

Arum lily is a dark green, succulent herb found in creeks, irrigation ditches and areas of summer-moist land, usually in large, dense clumps. It is both toxic to livestock and known to cause eczema in humans (DPIRD, 2020).

The Department of Primary Industries and Regional Development recommends the following for Arum Lily control periods (DPIRD, 2020; Table 4-3; Plate 4-1):

Table 4-3: Arum Lily Control

Species	Germination	Rosette/seedling	Flowering	Time to spray	Comments
Arum Lily	Late autumn-winter	Winter	Sept-Nov	June-Sept	Summer dormant perennial

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Search: at flowering												
Dormant												
Germination												
Actively growing												
Flowering: often staggered												
Fruiting												
Treatment												

Plate 4-1: Arum Lily Control Calendar

Source: DPIRD, 2020

Note: faded icon indicated occasional control

4.7 Access Control

Access within the management area will be restricted to only those residing within the developed site, and visitors to the estate. The entirety of the site will be fenced, and the only access vehicle will be via two secure access gates along Gavour Road and Welshpool Road East (Plate 4-2).

Currently, the boundary along Gavour Road is partly delineated by a brick wall, and it is proposed that this wall will remain in place as a design feature in the development. The remainder of the Gavour Road boundary, which is currently fenced by ring lock fencing, will be replaced with feature brick piers and open infill panels.



The management area will not contain access restricting fencing, as the area is proposed for recreation, and will utilise targeted recreation nodes (seating nodes, picnic tables, benches etc.) to discourage intrusion into unwanted areas.

05 | FENCING CONCEPT PLAN & IMAGERY

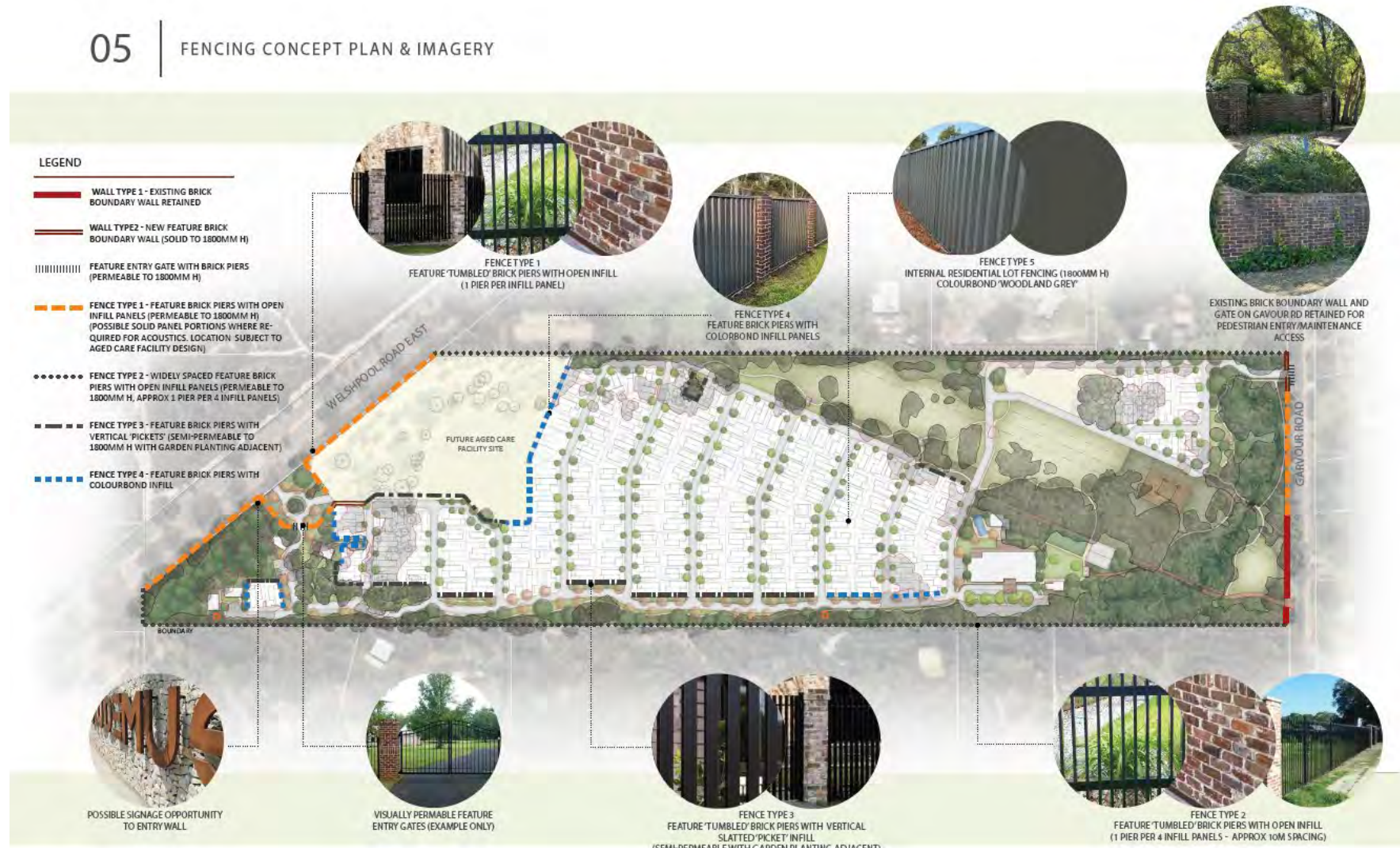


Plate 4-2: Proposed Fencing

Source: Plan E

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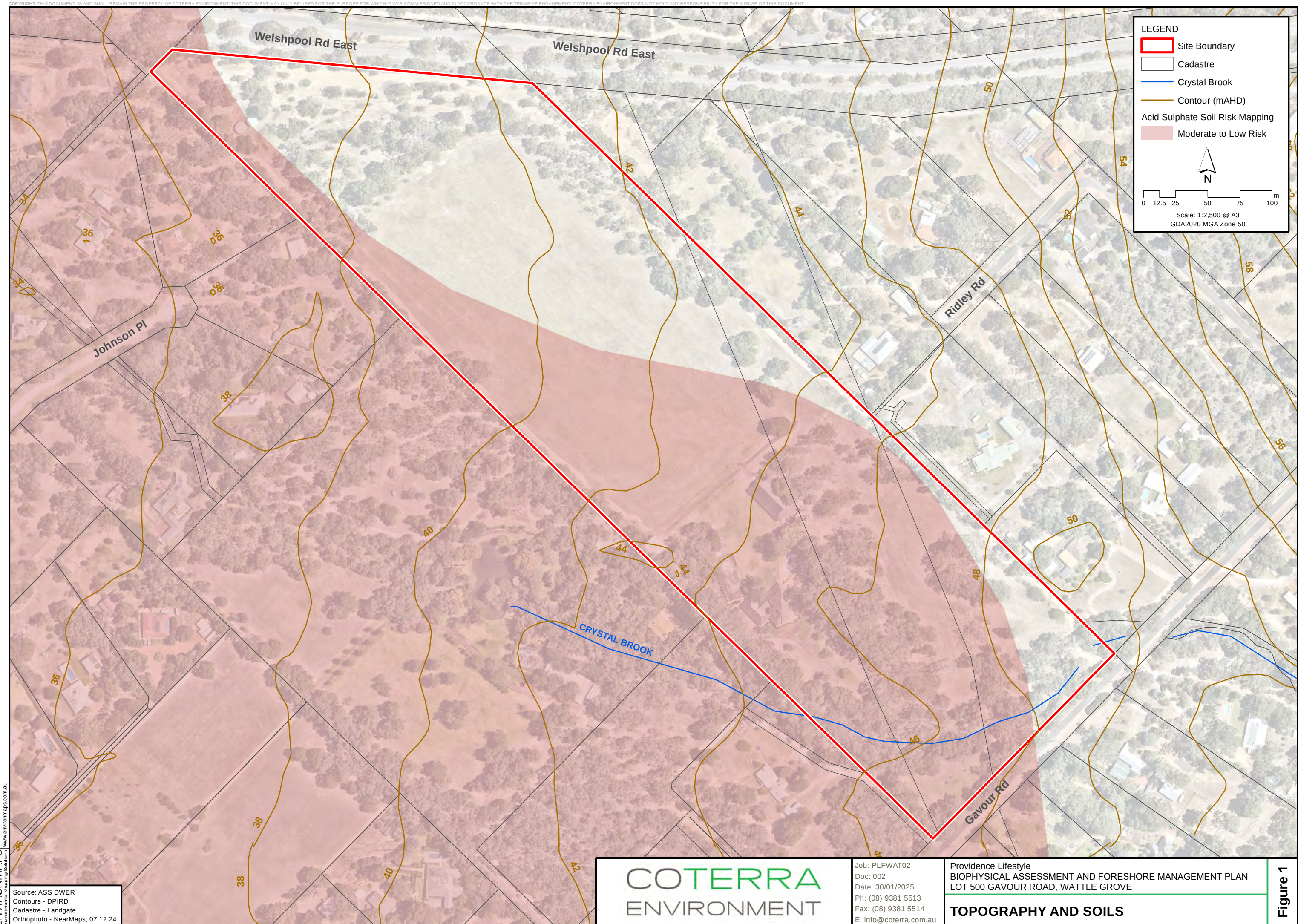
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Figures



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LEGEND

- Site Boundary
- Cadastre
- Crystal Brook
- Contour (mAHD)

Acid Sulphate Soil Risk Mapping

- Moderate to Low Risk

0 12.5 25 50 75 100m

Scale: 1:2,500 @ A3
GDA2020 MGA Zone 50

ENVIRONMAPS t: 0406 590 006
Environmental Mapping Solutions | www.environmentmaps.com.au

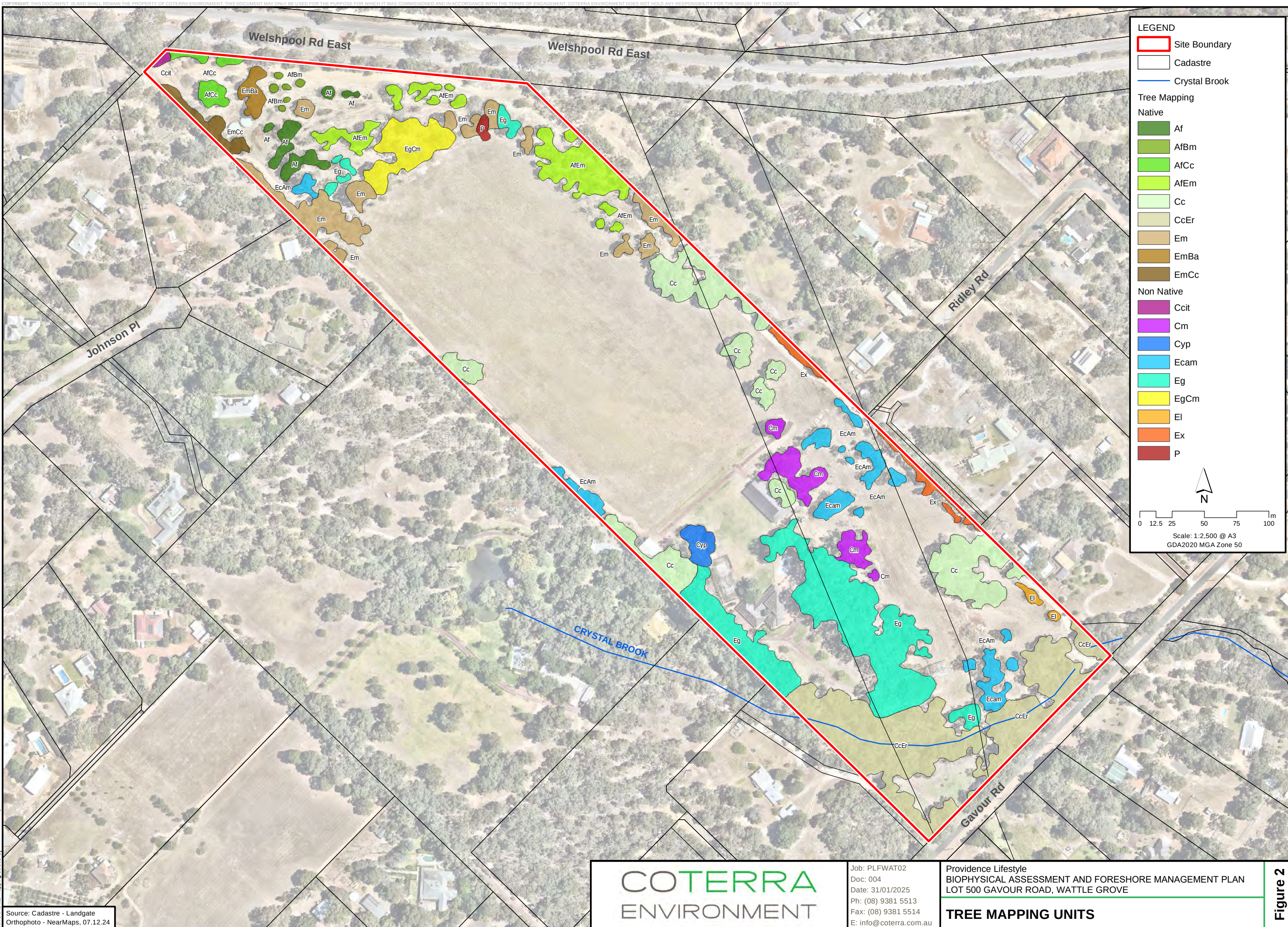
Source: ASS DWER
Contours - DPIRD
Cadastrre - Landgate
Orthophoto - NearMaps, 07.12.24

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Doc: 002
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Providence Lifestyle
BIOPHYSICAL ASSESSMENT AND FORESHORE MANAGEMENT PLAN
LOT 500 GAVOUR ROAD, WATTLE GROVE

TOPOGRAPHY AND SOILS

Figure 1



LEGEND

Site Boundary

Cadastre

Crystal Brook

Tree Mapping

Native

- Af
- AfBm
- AfCc
- AfEm
- Cc
- CcEr
- Em
- EmBa
- EmCc

Non Native

- Ccit
- Cm
- Cyp
- EcAm
- Eg
- EgCm
- EI
- Ex
- P

0 12.5 25 50 75 100

Scale: 1:2,500 @ A3
GDA2020 MGA Zone 50

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Source: Cadastre - Landgate
Orthophoto - NearMaps, 07.12.24

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LOT 500 GAVOUR ROAD, WATTLE GROVE

TREE MAPPING UNITS

Figure 2



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Source: Cadastre - Landgate
Orthophoto - NearMaps, 07.12.24

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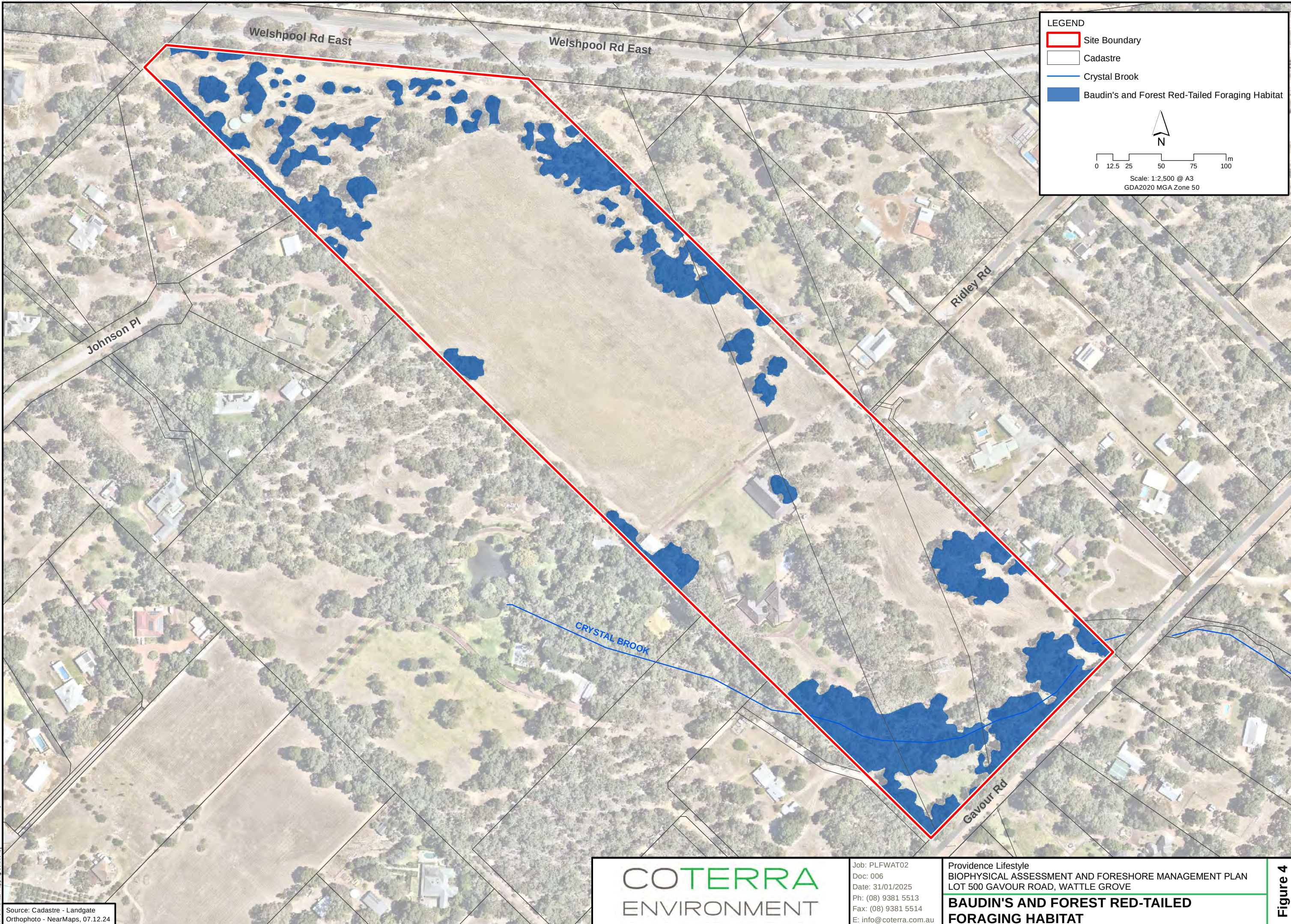
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BIOPHYSICAL ASSESSMENT AND FORESHORE MANAGEMENT PLAN
LOT500GAVOURROAD, W ATTLEGROVE

CARNABY'S FORAGING HABITAT

Figure 3



LEGEND

- Site Boundary
- Cadastral
- Crystal Brook
- Baudin's and Forest Red-Tailed Foraging Habitat

Scale: 1:2,500 @ A3
GDA2020 MGA Zone 50

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Source: Cadastre - Landgate
Orthophoto - NearMaps, 07.12.24

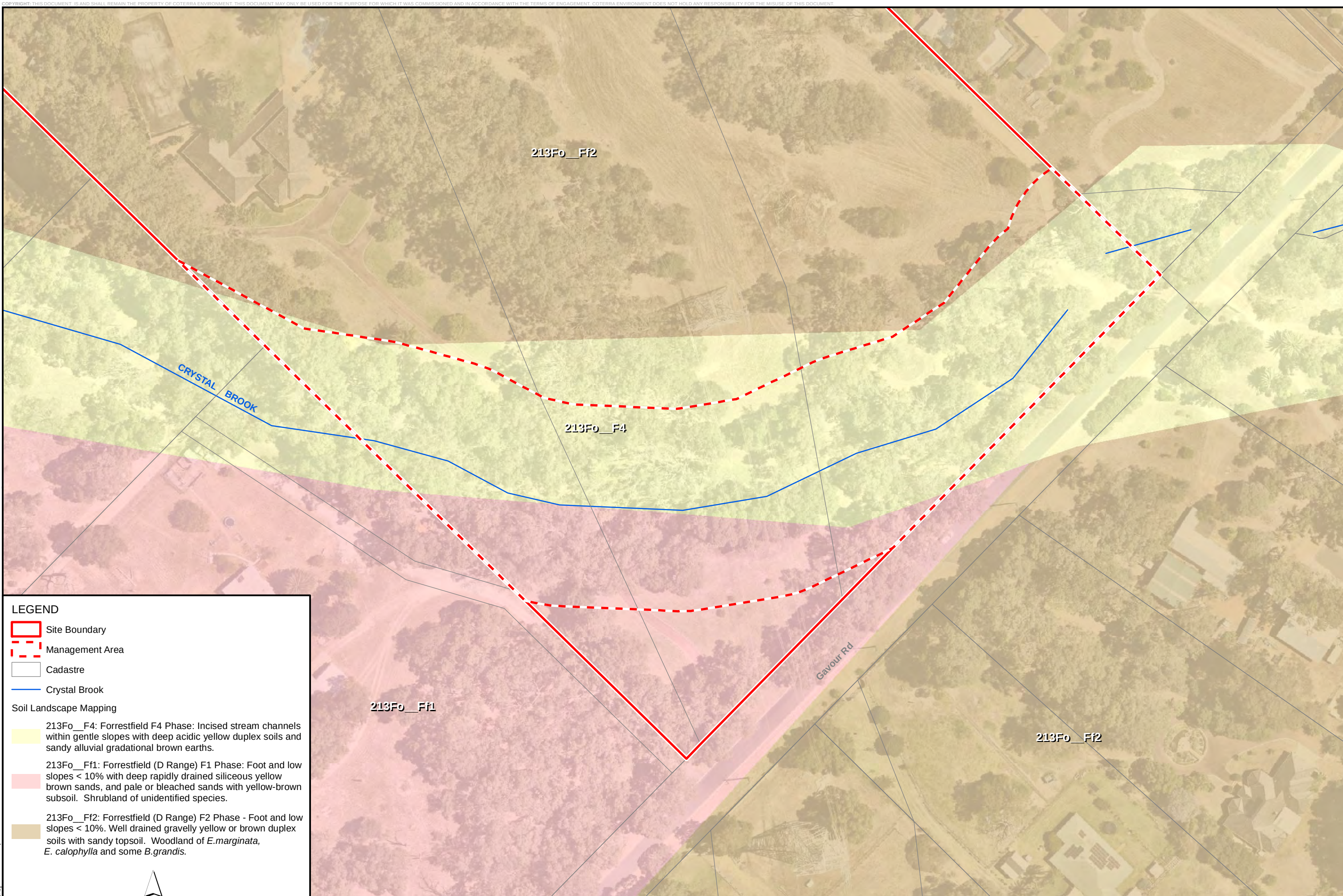
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LOT 500 GAVOUR ROAD, WATTLE GROVE

BAUDIN'S AND FOREST RED-TAILED FORAGING HABITAT

Figure 4



LEGEND

Site Boundary

Management Area

Cadastral

Crystal Brook

Soil Landscape Mapping

213Fo__F4: Forrestdfield F4 Phase: Incised stream channels within gentle slopes with deep acidic yellow duplex soils and sandy alluvial gradational brown earths.

213Fo__F1: Forrestdfield (D Range) F1 Phase: Foot and low slopes < 10% with deep rapidly drained siliceous yellow brown sands, and pale or bleached sands with yellow-brown subsoil. Shrubland of unidentified species.

213Fo__F2: Forrestdfield (D Range) F2 Phase - Foot and low slopes < 10%. Well drained gravelly yellow or brown duplex soils with sandy topsoil. Woodland of *E.marginata*, *E. calophylla* and some *B.grandis*.

0

10

20

40

60

80

m

Scale: 1:1,000 @ A3

GDA2020 MGA Zone 50

Source: Soil - DPIRD 027 | Cadastral - Landgate | Orthophoto - NearMaps, 07.12.24

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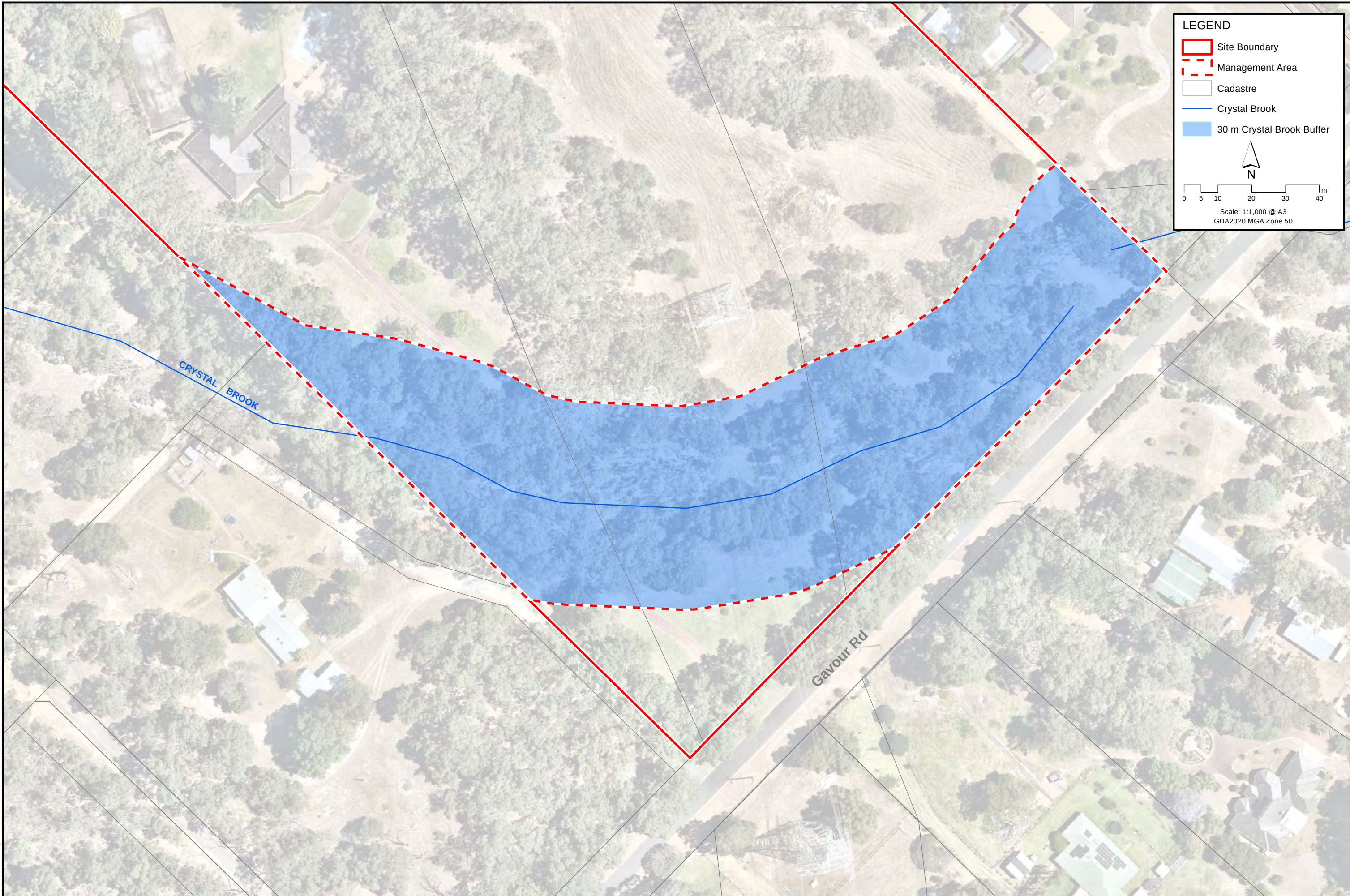
Providence Lifestyle

BIOPHYSICAL ASSESSMENT AND FORESHORE MANAGEMENT PLAN

LOT 500 GAVOUR ROAD, WATTLE GROVE

DPIRD SOIL MAPPING UNITS

Figure 5



Source: Cadastre - Landgate
Orthophoto - NearMaps, 07.12.24

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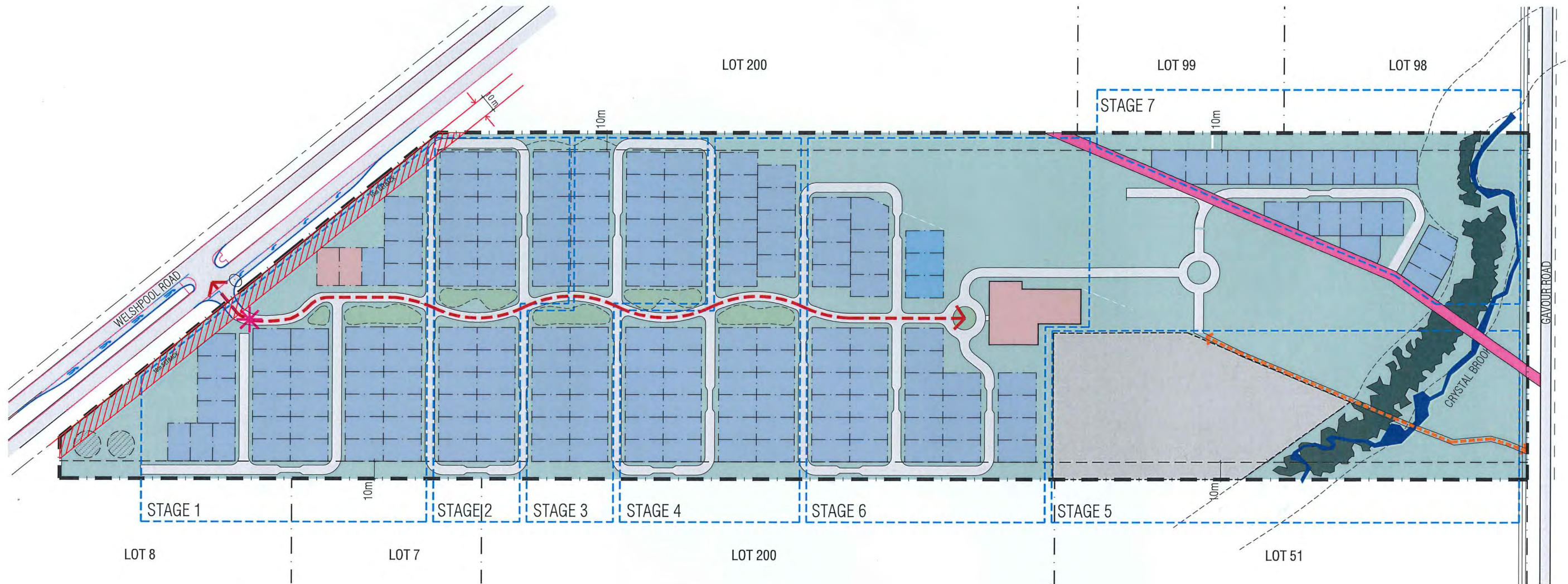
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Providence Lifestyle
BIOPHYSICAL ASSESSMENT AND FORESHORE MANAGEMENT PLAN
LOT 500 GAVOUR ROAD, WATTLE GROVE

IDENTIFIED MANAGEMENT AREA

Figure 6

Appendix 1 Local Development Plan



LEGEND

- | | | | |
|--|---|--|--|
| | SUBJECT SITE | | CLUBHOUSE |
| | PRIMARY VEHICLE ACCESS ROUTE | | LANDSCAPE ZONES
(REFER TO LANDSCAPE MASTERPLAN) |
| | SECONDARY EMERGENCY ACCESS ROUTE
(EXISTING DRIVEWAY) | | EXISTING VEGETATION TO BE MAINTAINED |
| | ENTRY STATEMENT
(SEE LANDSCAPE MASTER PLAN) | | 10m MINIMUM SETBACK |
| | INDEPENDENT LIVING SITES | | DEVELOPMENT APPLICATION STAGING |
| | AGED CARE FACILITY SITE | | WASTE WATER TREATMENT PLANT |
| | | | POSSIBLE FUTURE PUBLIC ROAD |

LOCAL DEVELOPMENT PLAN PROVISIONS:

This Local Development Plan (LDP) applies to Lot 500 (#32) Gavour Road, Wattle Grove. Unless otherwise varied by this LDP, development proposed shall be designed and assessed in accordance with the City of Kalamunda Local Planning Scheme No. 3, the Special Use zone requirements and any applicable Local Planning Policies. The following design requirements shall apply in conjunction with the requirements annotated on the plan:

1. Staging of development should be undertaken as generally shown on the LDP.
2. No development is to occur within the 80m wide Western Power easement other than landscaping, communal facilities (including caravan/boat parking, gardens/orchards, tennis courts, bowling green, etc) and vehicle access ways.
3. Fencing along the Welshpool Road property boundary and entry statement should be detailed in the Stage 1 Development Application.
4. Fencing along all other property boundaries is to be of post and wire construction.
5. Vehicle access to Welshpool Road and traffic issues should be assessed through a Traffic Impact Assessment at Development Application stage(s).
6. No development other than vehicle and pedestrian access ways permitted in areas in excess of BAL-29 bushfire zones (refer BAL Contour Plan and Bushfire Management Plan).
7. A Bushfire Management Plan is to be submitted with each Development Application for the relevant stage(s).
8. The Aged Care Facility is to be maximum two storey in height and detailed at the relevant Development Application stage.
9. The secondary vehicle access way to Gavour Road is for emergency access only and can be used by construction vehicles during staged development.
10. Landscaping areas are to be generally in accordance with the Landscape Master Plan. Further detail is required for landscaping at the relevant Development Application stage.
11. Rehabilitation of the Crystal Brook vegetation environment is to be detailed at the relevant Development Application stage. Existing vegetation associated with Crystal Brook to be retained where possible.

This Local Development Plan has been adopted by the City of Kalamunda in accordance with Clause 6.2.6 of Local Planning Scheme No. 3.

LDP APPROVAL NOTES:

1. An independent Road Safety Audit of the entry point at Welshpool Road East is to be conducted and any resultant road design adjustments made to the median and slip lane based on the recommendations of the Road Safety Audit prior to the lodgement of the Stage 1 development application. Any proposed works in relation to this will need to be undertaken at the time of implementation of Stage 1 of the development at the Applicant's cost.
2. The requirements of the Department of Fire and Emergency Services shall be addressed at Stage 1 of the development application process.
3. The 'future possible public road' identified on the Local Development Plan is subject to further investigation as part of any future Structure Planning for the area and surrounding land as required by Table 7: Implementation actions of the North East Subregional Planning Framework (2018) of the Western Australian Planning Commission.

Signature

Date

MJA studio

LEVEL 1, SUITE 6, 23 RAILWAY ROAD, SUBIACO WA 6008
T (08) 9388 0333 www.mjastudio.net | admin@mjastudio.net

Before any construction, alteration or other work is commenced the contractor must check all drawings and specifications against the latest of the drawings and to verify the responsibility of any discrepancies or variations which will be provided at the discretion of the contractor. The contractor is responsible for ensuring that all work is completed in accordance with the drawings and specifications. The contractor is responsible for ensuring that all work is completed in accordance with the drawings and specifications. The contractor is responsible for ensuring that all work is completed in accordance with the drawings and specifications.

REV.	DATE	AMENDMENT	INIT.
-	23.05.18	ISSUE FOR SUBMISSION	SB
-	12.11.18	UPDATED ISSUE	SB
-	14.12.18	UPDATED ISSUE	SB
-	07.02.19	UPDATED ISSUE	SB
-	04.06.19	UPDATED ISSUE	JL

REV.	DATE	AMENDMENT	INIT.

CLIENT

R. LEIGHTON

PROJECT

WATTLEGROVE RETIREMENT
PROJECT ADDRESS
LOT 500 GAUVR RD
WATTLE GROVE

MJA PROJECT NUMBER

18002

PROJECT STATUS

LDP APPLICATION

TRUE NORTH



SCALE

1:1000 @ B1

PROJECT NORTH



0 10 20 50

DRAWING

LOCAL DEVELOPMENT PLAN

DRAWING NO.

A1.01

DRAFTER

SB

CHECKED

WB

REV.

-

Appendix 2 Flora and Vegetation Assessment (Western Botanical, 2018)



**Western
Botanical**

Reconnaissance Survey of Flora and Vegetation Lot 500 Gavour Road Wattle Grove December 2018

Prepared for: Aquatic Solutions

Report Ref: WB894



© Landcare Holdings Pty Ltd trading as Western Botanical
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Report No: WB894

Client Name: Aquatic Solutions

Client Address: Not Supplied

Version	Prepared By	Approved for Issue	Issue Date
Final 1	Dr David Leach	Mr Geoff Cockerton	03/12/2018
Final 2	Dr David Leach	Dr David Leach	05/12/2018

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This report has been designed for double-sided printing

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1. Introduction

Aquatic Solutions engaged Western Botanical to undertake a Reconnaissance Level flora and vegetation survey of Lot 500 Gavour Road (the Project Area, Appendix 1), a 15.2 ha property in Wattle Grove. The flora survey was commissioned for the purpose of approvals as part of a commercial land development. A half-day survey was conducted on the 19th of October 2018 to map vegetation structure units and vegetation condition within the Project Area.

The Project Area lies primarily within the Swan Coastal Plain IBRA region (SWA2 subregion) with a small portion lying within the Jarrah IBRA region (JF1 subregion). The Project Area is wholly within the City of Kalamunda Local Government Area.

2. Methods

A desktop survey was conducted to detect previous records of conservation significant flora or vegetation communities within and near the Project Area. Database searches performed included:

- NatureMap search with 10 km radius
- DBCA's Threatened and Priority Flora databases with 7.5 km radius
- DBCA's Threatened and Priority Ecological Communities database with 5 km radius

A field survey was conducted in spring on the 19th of October 2018 by a single botanist with 10 years of botanical consulting experience within Western Australia and the Swan Coastal Plain. The entirety of the Project Area was traversed on foot to enable mapping of native vegetation units and to assess their condition using the Keighery Condition Scale (Appendix 2). As a reconnaissance survey, a species inventory and targeted search were beyond the survey's scope.

Flora voucher specimens were collected to confirm or determine the identity of key structural flora species. Identity of voucher specimens were finalised using the resources of the Western Australian Herbarium.

3. Results and Discussion

3.1. Desktop Survey

Searches of DBCA's Threatened and Priority Flora databases (reference 89-1018FL) and NatureMap produced a list of 98 taxa of conservation significance within 7.5 to 10 km of the Project Area (Appendix 3). This number of conservation significant flora is not unusual for metropolitan areas of the Swan Coastal Plain IBRA region.

No pre-existing records of conservation significant flora were found within the Project Area.

Pre-existing records for *Conospermum undulatum* (T), *Isopogon drummondii* (P3), and *Lasiopetalum glutinosum* subsp. *glutinosum* (P3) occur within 120 m of the Project Area's northern boundaries.

A search of DBCA's Threatened and Priority Ecological Communities database (DBCA Ref: 38-01118EC) found 12 records of TEC/PEC communities that cover a portion of the Project Area (Appendix 4). These records consist of:

- One polygon of '*SCP20a, Banksia attenuata woodland over species rich dense shrublands*', a Threatened Ecological Community (TEC) endorsed by the Western Australian Minister for Environment.
- Eleven polygons of '*Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*', which is a;
 - o i) Priority 3 Ecological Community (PEC) endorsed by the Western Australian Minister of Environment, and
 - o ii) Threatened Ecological Community (TEC) of national significance under the Environment Protection and Biodiversity Conservation Act 1999.

For nine of the detected 12 TEC/PEC community records, only the buffer portions overlie the Project Area, indicating those records do not originate from the Project Area. The three remaining TEC/PEC records indicate the existence of TEC/PEC vegetation within the Project Area, all of which are '*Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*' PEC and TEC.

3.2. Vegetation Mapping

Eight vegetation units were mapped during survey (Appendix 5). Completely cleared areas comprised of landscaped garden and cleared fields (8.25 ha, 54.28% % of Project Area) were not considered native vegetation and not mapped within a vegetation unit. Brief descriptions of mapped vegetation units are provided below.

3.2.1. Unit 1: *Banksia menziesii* open woodland

Open woodland of *Banksia menziesii* (approximately 10 trees) with understory of resprouting *Xanthorrhoea* (Plate 1). This vegetation unit occupies 0.32 ha or 2.11% of the Project Area and has a Keighery condition rating of 'Good'. The native understorey within this unit was slashed for fire mitigation purposes approximately four weeks prior to survey.



Plate 1. Photo of Unit 1 *Banksia menziesii* open woodland.

3.2.2. Unit 2: *Eucalyptus marginata* subsp. *marginata* and *Allocasuarina fraseriana* open woodland

Open woodland of *Eucalyptus marginata* subsp. *marginata* and *Allocasuarina fraseriana* with occasional trees of *Banksia attenuata* (Plate 2). This vegetation unit occupies 0.57 ha or 3.75% of the Project Area and has a Keighery condition rating of 'Good'. The native understorey within this unit was slashed for fire mitigation purposes approximately four weeks prior to survey.



Plate 2. Photo of Unit 2 *Eucalyptus marginata* subsp. *marginata* and *Allocasuarina fraseriana* open woodland.

3.2.3. Unit 3: *Corymbia calophylla* sparse woodland

Sparse open woodland of *Corymbia calophylla* with sparse understory of resprouting *Xanthorrhoea* (Plate 3). This vegetation unit occupies 0.27 ha or 1.78% of the Project Area and has a Keighery condition rating of 'Good'. The native understory within this unit was slashed for fire mitigation purposes approximately four weeks prior to survey.



Plate 3. Photo of Unit 3 *Corymbia calophylla* sparse woodland.

3.2.4. Unit 4: *Corymbia calophylla* open woodland

Open woodland of *Corymbia calophylla* with dense mixed understory containing occasional small trees of *Banksia illicifolia*. This vegetation unit occupies 0.10 ha or 0.66% of the Project Area and has a Keighery condition rating of 'Good'. The unit represents a very narrow band along the property fenceline with the majority of *Corymbia calophylla* trees being outside but adjacent to the Project Area boundary.

3.2.5. Unit 5: *Corymbia calophylla* (*Eucalyptus rudis*) open woodland over degraded/cleared

Open woodland of *Corymbia calophylla* (*Eucalyptus rudis* variably present) over a historically cleared understory (Plate 4). This vegetation unit occupies 2.91 ha or 19.14% of the Project Area and has a Keighery condition rating of 'Degraded' with an almost complete absence of understory due to previous land use practices.



Plate 4. Photos of Unit 4 *Corymbia calophylla* (*Eucalyptus rudis*) open woodland over degraded/cleared.

3.2.6. Unit 6: *Corymbia citriodora* (planted) and *Eucalyptus rudis* woodland over degraded/cleared

Open woodland of *Corymbia citriodora* (planted) and *Eucalyptus rudis* (remnant) woodland over a historically cleared understorey (Plate 5). This vegetation unit occupies 0.84 ha or 5.53% of the Project Area and has a Keighery condition rating of ‘Degraded’ due to an almost complete absence of understorey due to previous land use practices.



Plate 5. Photo of Unit 6 *Corymbia citriodora* (planted) and *Eucalyptus rudis* woodland over degraded/cleared.

3.2.7. Unit 7: *Corymbia calophylla* woodland over dense garden planting

Corymbia calophylla woodland over a dense tall understorey and ground layer of exotic plantings (Plate 6). This vegetation unit occupies 1.51 ha or 9.93% of the Project Area and has a Keighery condition rating of ‘Completely Degraded’ from an almost complete absence of understorey due to previous land use practices. A creek runs through a portion of the unit but is not associated with a separate vegetation unit. The Declared Pest *Zantedeschia aethiopica* (Arum Lilly) is present within this unit.



Plate 6. Photos of Unit 7 *Corymbia calophylla* woodland over dense garden planting.

3.2.8. Unit 8: Mixed native and exotic plantings

A variable unit representing historically completely cleared areas with mixed plantings of exotic species and non-local native species (Plate 7). This vegetation unit occupies 0.43 ha or 2.83% of the Project Area and has a Keighery rating of ‘Completely Degraded’ due to complete absence of native vegetation.



Plate 7. Photo (right of view) of Unit 8 Mixed native and exotic plantings.

3.3. Significant Flora

None of the dominant structural species surveyed were found to be of conservation significance (Threatened or Priority Flora). The identification of the recently slashed understorey components of Units 1, 2 and 3 lay outside the scope of this survey and this aspect is not addressed.

3.4. Significant Communities

Results of the DBCA Threatened and Ecological Communities database search (see Section 3.1) indicate the presence of the Threatened and Priority Ecological Community (TEC and PEC); '*Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*'.

In contrast to the DBCA search results, the field survey revealed a majority of the Project Area's native vegetation lying within the three relevant TEC/PEC polygon records does not consist of *Banksia* dominated woodland.

However, one vegetation unit of the Project Area (Unit 1 '*Banksia menziesii* open woodland') has affinity to the '*Banksia Dominated Woodlands*' TEC and PEC and is within the DBCA's pre-existing records of that significant community.

Though small (0.32 ha or 2.11% of the Project Area) Vegetation Unit 1 '*Banksia menziesii* open woodland' may represent an instance of the '*Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*' PEC and TEC (Priority Ecological Community and Threatened Ecological Community).

An assessment of the understorey components following recovery after slashing of Vegetation Unit 1 will inform whether this unit represents the above PEC and TEC. Further advice regarding the TEC/PEC status of Vegetation Unit 1, following recovery and assessment of understorey components, should be sought from the Department of Biodiversity, Conservation and Attractions.

3.5. Weeds

Pasture and garden weeds were common within the Project Area, consistent with the property's history of horse keeping and landscaping. No Weeds of National Significance (WoNS) were encountered during the survey.

The Declared Pest plant *Zantedeschia aethiopica* (Arum Lilly) was encountered within vegetation unit 7 (*Corymbia calophylla* woodland over dense garden planting). Control of this weed is recommended and may be required under the Biosecurity and Agriculture Management Act 2007.

3.6. Vegetation Condition

Table 1 presents a summary of vegetation condition as related to mapped vegetation units. The overall vegetation condition for the majority of the Project Area is 'Degraded' to 'Completely Degraded'. A minority of the Project Area (1.26 ha or 8.29%) has a condition rating of 'Good'.

Table 1. Summary of vegetation condition in relation to mapped vegetation units.

Vegetation Condition (Keighery Scale)	Area (ha)	Area (%)	Included Vegetation Units
Pristine	0	0%	None
Excellent	0	0%	None
Very Good	0	0%	None
Good	1.26	8.29%	1, 2, 3, 4
Degraded	3.75	24.67%	5, 6
Completely Degraded	10.19	67.04%	7, 8, and non-vegetated areas

4. List of Participants

Staff Member	Field Surveys	Specimen Identification	Data Analysis	Report Preparation
Dr David Leach Flora License SL012379	✓	✓	✓	✓
Mr Geoff Cockerton				✓

5. References

Biosecurity and Agriculture Management Act 2007. Government of Australia. Accessed November 2018. URL: https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_2736_homepage.html

Department of Biodiversity, Conservation and Attractions (2018) Threatened and Priority Flora Databases (reference 89-1018FL).

Department of Biodiversity, Conservation and Attractions (2018) Threatened Ecological Community and Priority Ecological Community Databases (reference: 38-01118EC).

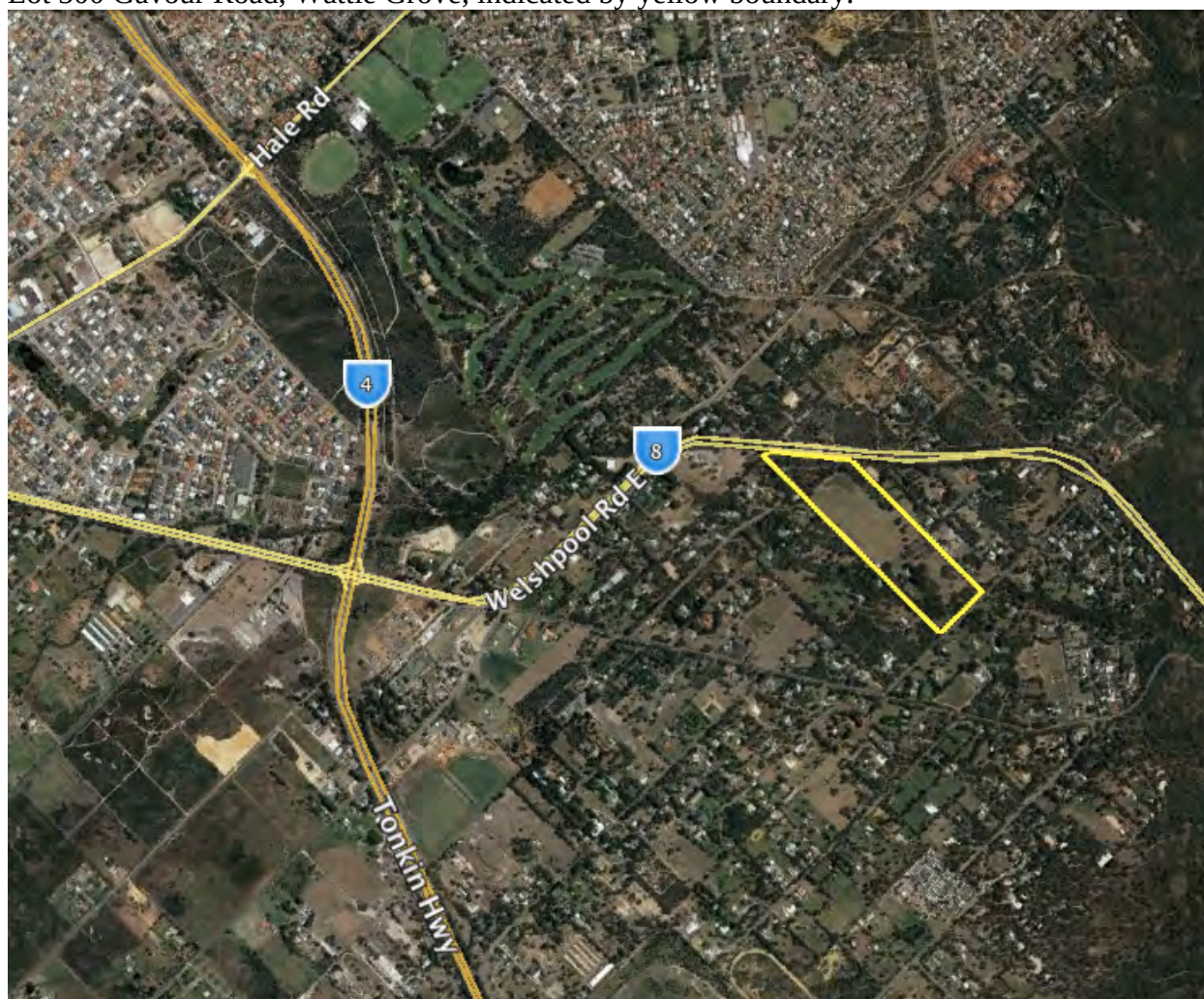
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Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Government of Australia. Accessed November 2018. URL: <http://www.environment.gov.au/epbc>

Environmental Protection Authority (2016). Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment. Government of Western Australia, Perth WA.

Appendix 1. Project Area location.

Lot 500 Gavour Road, Wattle Grove, indicated by yellow boundary.



Appendix 2. Keighery scale of Vegetation Condition.

As presented in Environmental Protection Authority (2016)

Vegetation Condition	South West and Interzone Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as ‘parkland cleared’ with the flora comprising weed or crop species with isolated native trees and shrubs.

Appendix 3. Summary of Threatened and Priority Flora Database Search Results.

Flora Taxon	Conservation Code	Database		
		DBCA WAHerb	DBCA TPFL	NatureMap
<i>Acacia anomala</i>	Threatened	✓	✓	✓
<i>Acacia aphylla</i>	Threatened	✓	✓	✓
<i>Andersonia gracilis</i>	Threatened	✓	✓	✓
<i>Anthocercis gracilis</i>	Threatened	✓	✓	✓
<i>Austrostipa bronwenae</i>	Threatened	✓	✓	✓
<i>Banksia mimica</i>	Threatened	✓	✓	✓
<i>Caladenia huegelii</i>	Threatened	✓		✓
<i>Calectasia cyanea</i>	Threatened			✓
<i>Calytrix breviseta</i> subsp. <i>breviseta</i>	Threatened	✓	✓	✓
<i>Conospermum undulatum</i>	Threatened	✓	✓	✓
<i>Darwinia apiculata</i>	Threatened	✓	✓	✓
<i>Diuris purdiei</i>	Threatened	✓	✓	✓
<i>Eleocharis keigheryi</i>	Threatened	✓		✓
<i>Eremophila glabra</i> subsp. <i>chlorella</i>	Threatened	✓	✓	✓
<i>Goodenia arthrotricha</i>	Threatened	✓	✓	✓
<i>Grevillea curviloba</i> subsp. <i>incurva</i>	Threatened			✓
<i>Grevillea thelemanniana</i>	Threatened	✓	✓	✓
<i>Lepidosperma rostratum</i>	Threatened	✓	✓	✓
<i>Macarthuria keigheryi</i>	Threatened	✓	✓	✓
<i>Ptilotus pyramidatus</i>	Threatened	✓	✓	✓
<i>Synaphea</i> sp. Fairbridge Farm (D. Papenfus 696)	Threatened		✓	✓
<i>Tetralix australiensis</i>	Threatened	✓		✓
<i>Thelymitra stellata</i>	Threatened	✓	✓	✓
<i>Acacia lasiocarpa</i> var. <i>bracteolata</i> long peduncle variant (G.J. Keighery 5026)	Priority 1			✓
<i>Amanita quenda</i>	Priority 1	✓		✓
<i>Bolboschoenus fluviatilis</i>	Priority 1	✓		
<i>Boronia humifusa</i>	Priority 1	✓	✓	✓
<i>Calandrinia</i> sp. Piawaning (A.C. Beauglehole 12257)	Priority 1	✓		✓
<i>Haloragis scoparia</i>	Priority 1			✓
<i>Hydrocotyle striata</i>	Priority 1	✓		✓
<i>Ptilotus sericostachyus</i> subsp. <i>roseus</i>	Priority 1			✓
<i>Schoenus</i> sp. Beaufort (G.J. Keighery 6291)	Priority 1	✓		✓
<i>Senecio gilbertii</i>	Priority 1	✓		✓
<i>Thelymitra magnifica</i>	Priority 1	✓	✓	✓
<i>Andersonia</i> sp. <i>Blepharifolia</i> (F. & J. Hort 1919)	Priority 2	✓		✓
<i>Comesperma griffinii</i>	Priority 2	✓		✓
<i>Isotropis cuneifolia</i> subsp. <i>glabra</i>	Priority 2	✓		✓
<i>Lepyrodia curvescens</i>	Priority 2	✓		✓
<i>Melaleuca viminalis</i>	Priority 2	✓		✓
<i>Paracaleana</i> sp. Laterite (G. Brockman GBB 3571)	Priority 2			✓
<i>Schoenus loliaceus</i>	Priority 2	✓		✓
<i>Thysanotus</i> sp. Badgingarra (E.A. Griffin 2511)	Priority 2			✓
<i>Acacia drummondii</i> subsp. <i>affinis</i>	Priority 3			✓
<i>Acacia horridula</i>	Priority 3	✓	✓	✓
<i>Acacia oncinophylla</i> subsp. <i>oncinophylla</i>	Priority 3			✓
<i>Allocasuarina grevilleoides</i>	Priority 3	✓		✓
<i>Amanita kalamundae</i>	Priority 3	✓		
<i>Amanita wadjukiorum</i>	Priority 3	✓		✓
<i>Asteridea gracilis</i>	Priority 3	✓	✓	✓
<i>Babingtonia urbana</i>	Priority 3	✓	✓	✓
<i>Banksia kippistiana</i> var. <i>paenepeccata</i>	Priority 3			✓
<i>Banksia pteridifolia</i> subsp. <i>vernalis</i>	Priority 3	✓		✓
<i>Beaufortia purpurea</i>	Priority 3	✓		✓
<i>Byblis gigantea</i>	Priority 3	✓	✓	✓

Flora Taxon	Conservation Code	Database		
		DBCA WAHerb	DBCA TPFL	NatureMap
<i>Carex tereticaulis</i>	Priority 3	✓	✓	✓
<i>Chamaescilla gibsonii</i>	Priority 3	✓		✓
<i>Comesperma rhadinocarpum</i>	Priority 3	✓	✓	✓
<i>Eryngium pinnatifidum</i> subsp. <i>palustre</i> (G.J. Keighery 13459)	Priority 3	✓		✓
<i>Eryngium</i> sp. <i>Subdecumbens</i> (G.J. Keighery 5390)	Priority 3	✓	✓	✓
<i>Grevillea manglesii</i> subsp. <i>dissectifolia</i>	Priority 3			✓
<i>Haemodorum loratum</i>	Priority 3	✓	✓	✓
<i>Halgania corymbosa</i>	Priority 3	✓	✓	✓
<i>Isopogon drummondii</i>	Priority 3	✓		✓
<i>Jacksonia gracillima</i>	Priority 3	✓		✓
<i>Lasiopetalum glutinosum</i> subsp. <i>glutinosum</i>	Priority 3	✓		✓
<i>Meionectes tenuifolia</i>	Priority 3	✓		✓
<i>Myriophyllum echinatum</i>	Priority 3	✓		✓
<i>Pithocarpa corymbulosa</i>	Priority 3	✓	✓	✓
<i>Platysace ramosissima</i>	Priority 3	✓	✓	✓
<i>Schoenus benthamii</i>	Priority 3	✓	✓	✓
<i>Schoenus capillifolius</i>	Priority 3	✓	✓	✓
<i>Schoenus pennisetis</i>	Priority 3	✓	✓	✓
<i>Schoenus</i> sp. Waroona (G.J. Keighery 12235)	Priority 3	✓		✓
<i>Sporobolus blakei</i>	Priority 3			✓
<i>Stackhousia</i> sp. Red-blotched corolla (A. Markey 911)	Priority 3	✓		✓
<i>Stylidium aceratum</i>	Priority 3	✓		✓
<i>Stylidium periscelanthum</i>	Priority 3			✓
<i>Styphelia filifolia</i>	Priority 3	✓		✓
<i>Thysanotus anceps</i>	Priority 3	✓	✓	✓
<i>Acacia oncinophylla</i> subsp. <i>patulifolia</i>	Priority 4	✓	✓	✓
<i>Aponogeton hexatepalus</i>	Priority 4	✓	✓	✓
<i>Boronia tenuis</i>	Priority 4	✓	✓	✓
<i>Calothamnus accedens</i>	Priority 4	✓		✓
<i>Calothamnus graniticus</i> subsp. <i>leptophyllus</i>	Priority 4			✓
<i>Centrolepis caespitosa</i>	Priority 4	✓		✓
<i>Cyanicula ixioideis</i> subsp. <i>ixioideis</i>	Priority 4	✓		✓
<i>Drosera occidentalis</i> subsp. <i>occidentalis</i>	Priority 4		✓	✓
<i>Hibbertia montana</i>	Priority 4	✓		✓
<i>Hydrocotyle lemnoides</i>	Priority 4	✓	✓	✓
<i>Lasiopetalum bracteatum</i>	Priority 4	✓		✓
<i>Ornduffia submersa</i>	Priority 4	✓	✓	✓
<i>Pimelea rara</i>	Priority 4	✓	✓	✓
<i>Schoenus griffinianus</i>	Priority 4			✓
<i>Schoenus natans</i>	Priority 4	✓		✓
<i>Senecio leucoglossus</i>	Priority 4	✓	✓	✓
<i>Stylidium longitubum</i>	Priority 4	✓	✓	✓
<i>Stylidium striatum</i>	Priority 4	✓	✓	✓
<i>Verticordia lindleyi</i> subsp. <i>lindleyi</i>	Priority 4	✓	✓	✓

Appendix 4: TEC/PEC records of the Project Area



Image Key:

Green polygons:

- 3 x records of '*Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*' PEC (WA) and TEC (National)

Clear polygons (buffer portion within Project Area only):

- 1 x record of '*SCP20a, Banksia attenuata woodland over species rich dense shrublands*' TEC (Western Australia)
- 8 records of '*Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region*' PEC (WA) and TEC (National)

Appendix 5. Vegetation Structural Units map.

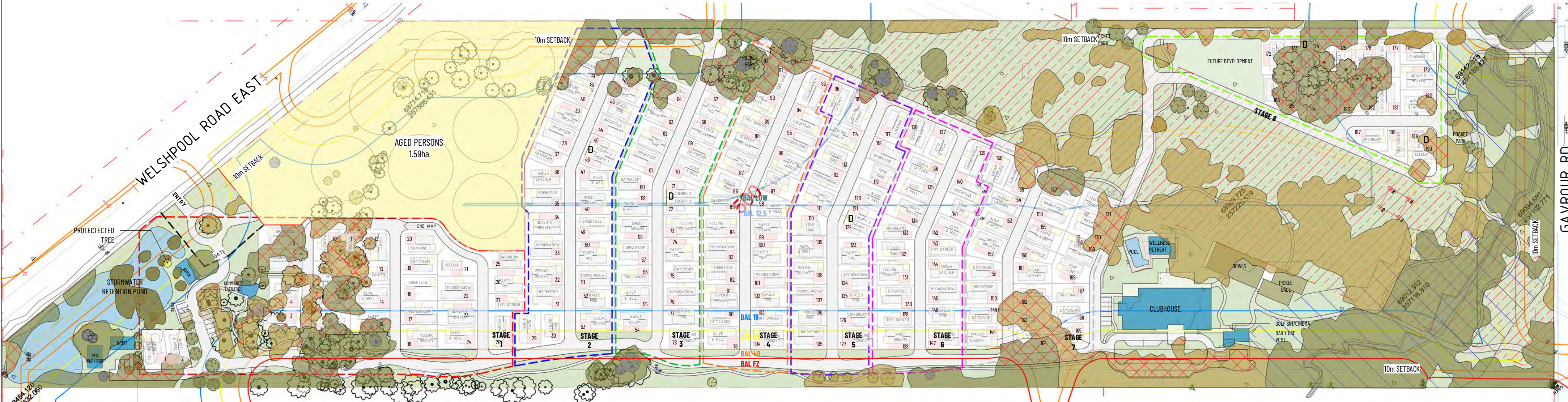


Vegetation Unit Key:

- Unit 1: *Banksia menziesii* open woodland
- Unit 2: *Eucalyptus marginata* subsp. *marginata* and *Allocasuarina fraseriana* open woodland
- Unit 3: *Corymbia calophylla* sparse woodland
- Unit 4: *Corymbia calophylla* open woodland
- Unit 5: *Corymbia calophylla* (*Eucalyptus rudis*) open woodland over degraded/cleared
- Unit 6: *Corymbia citriodora* (planted) and *Eucalyptus rudis* woodland over degraded/cleared
- Unit 7: *Corymbia calophylla* woodland over dense garden planting
- Unit 8: Mixed native and exotic plantings



Appendix 3 Landscape Concept Plan



STAGE 1
28 HOMES

STAGE 2
28 HOMES

STAGE 3
27 HOMES

STAGE 4
24 HOMES

STAGE 5
21 HOMES

STAGE 6
18 HOMES

STAGE 7
21 HOMES

STAGE 8
23 HOMES

BAL - LOW

BAL - 12.5

BAL - 19

BAL - 29

BAL - 40

BAL - FZ

CLUBHOUSE & ANCILLARY BUILDINGS

REMNAINT & LANDSCAPED GROUNDS

NATIVE VEGETATION

NON-NATIVE VEGETATION

SINGLE HOUSE LOT
270m² (13x21m)

DUPLEX LOT
AVG. 180m²
★ NON-STANDARD SIZE

KEY NESTING TREES TO BE RETAINED

WESTERN POWER EASEMENT

30m BROOK BUFFER ZONE

MAX NATIVE VEGETATION REMOVAL 6363.5m²

MAX NON-NATIVE VEGETATION REMOVAL 4149.3m²

TOTAL

190 HOMES

NOTE 1: REMOVAL AREA BASED ON CANOPY

NOTE 2: REMOVAL AREA EXCLUDES AGED PERSONS SUB-DIVISION

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No.	Description	Date
D	REVISED ROAD LAYOUT	05.02.2025
E	ADJUSTED HOUSE MIX, ADDED PARK SPACE	26.02.2025
F	ENTRY RD & PARKING REALIGNED	02.04.2025
G	LOT ADJUSTMENT FOR BAL	24.06.2025
H	TREE RETENTION	02.07.2025

PROVIDENCE LIFESTYLE

WATTLE GROVE LIFESTYLE RESORT

32 GAVOUR RD, WATTLE GROVE, 6107

Site Masterplan

Project number		A2.01
Date	02.07.2025	
Drawn by	RHA	
Checked by	RHA	
Scale@A2		As indicated

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