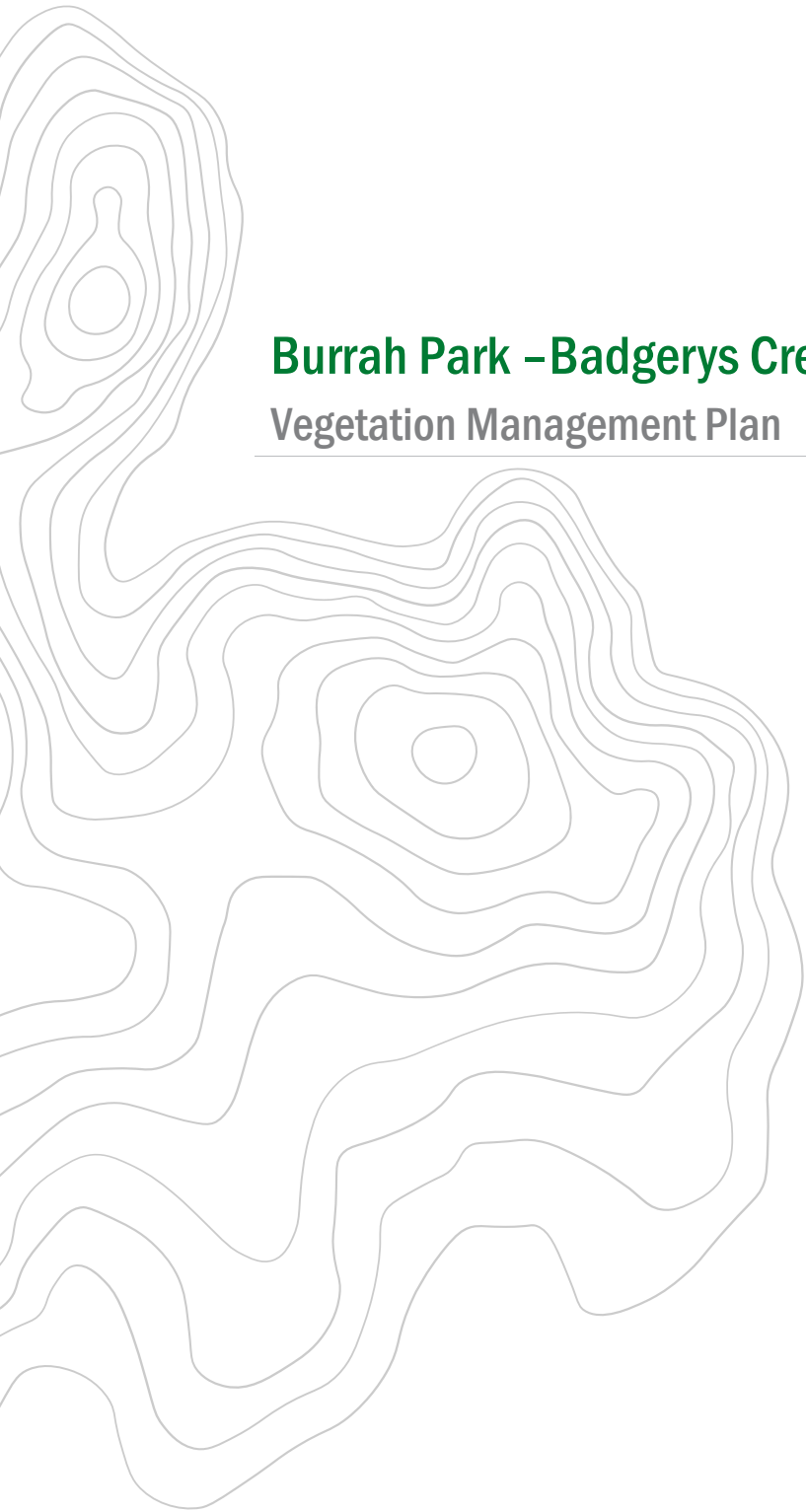


A decorative graphic on the left side of the page consisting of several concentric, irregular contour lines in a light grey color, resembling a topographic map. The lines are more densely packed in some areas and more spread out in others, creating a sense of depth and terrain.

Burrah Park –Badgerys Creek

Vegetation Management Plan

Document Tracking

Project Name:	Burrah Park
Project Number:	24SYD8475X
Project Manager:	Courtney Blick

Version	Prepared by	Reviewed by	Approved by	Status	Date
1	Courtney Blick Andrew Norvill Michael Gregor	Andrew Whitford David Bonjer	David Bonjer	Draft	15/08/2024
2	Courtney Blick	Andrew Whitford David Bonjer	David Bonjer	Draft	2/10/2024
3	Courtney Blick	Andrew Whitford David Bonjer	David Bonjer	Final	10/10/2024
4	Michael Gregor	Andrew Whitford	Andrew Whitford	Final	11/06/2025
5	Courtney Blick	David Bonjer	David Bonjer	Final	17/12/2025

This report should be cited as ‘Eco Logical Australia 2025, *Burrah Park – Vegetation Management Plan*. Prepared for HB&B Property.’

Acknowledgements

This document has been prepared by Eco Logical Australia Pty Ltd with support from HB&B Property.

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Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
CPCP	Cumberland Plain Conservation Plan
DCP	Development Control Plan
ELA	Eco Logical Australia
LGA	Local Government Area
LLS	Local Land Services
PCC	Penrith City Council
PCT	Plant community Type
SSD	State Significant Development
SSDA	State Significant Development Application
TPZ	Tree Protection Zones
VMP	Vegetation Management Plan
WONS	Weeds of National Significance
Western Parkland City SEPP	<i>State Environmental Planning Policy (Precincts – Western Parkland City) 2021</i>

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1. Introduction

This Vegetation Management Plan (VMP) has been prepared by Eco Logical Australia Pty Ltd (ELA) to accompany a State Significant Development Application (SSDA) for a Concept and Stage 1 SSDA for a Warehouse and Logistics Estate at 1953-2109 Elizabeth Drive, Badgerys Creek, legally described as Lot 1 in Deposited Plan (DP) 1306448 (the study area). The study area is located within the Penrith City Council (PCC) Government Area (LGA) (Figure 1), and forms part of the area managed under the Cumberland Plain Conservation Plan (CPCP).

1.1. Background

The development proposes to construct a warehouse and logistics estate comprising of several warehouses, internal road network, car parks, landscaping, and associated infrastructure. The subject land (approximately 170 hectares) includes a mixture of native and exotic vegetation, waterbodies and watercourses.

Under the CPCP, the site is comprised of four land categories, being:

- Avoided Land
- Excluded Land
- Certified - Major Transport Corridor
- Certified - Urban Capable Land

Primarily, the site is Certified - Urban Capable Land with the other categories on the western, northern and southern extents of the development (Figure 2). Under the *State Environmental Planning Policy (Precincts - Western Parkland City) 2021* (Western Parkland City SEPP), the land is primarily comprised of Enterprise land with the western border along the riparian corridor and the central drainage line (including four farm dams) mapped as Environment and Recreation lands (Figure 3). In addition, the land mapped as Environment and Recreation lands is also mapped as Priority Parkland areas under the Western Sydney Aerotropolis Development Control Plan – Appendices (Western Sydney Planning Partnership 2021) (Figure 4).

This VMP has been prepared to satisfy the objectives in Section 2.3 of the Western Sydney Aerotropolis Development Control Plan (DCP) Phase 2 which include:

- *Protect and restore native and riparian vegetation to improve the connectivity, ecological condition, and ecological function of ecosystems.*
- *Ensure that development does not adversely affect aquatic fauna* – noting that this is also addressed in a separate Dam Dewatering Plan (DDP), as part of the Biodiversity Management Plan (ELA 2023c))
- *Effectively manage indirect and ongoing impacts of development adjacent to waterways to ensure vegetation in the riparian area, aquatic fauna, water quality and quantity is protected and maintained.*
- *Reinstate more natural conditions in highly modified waterways and riparian land while not increasing the flood risk.*

This VMP has been prepared based on current best practice and is consistent with the Natural Resources Access Regulator (NRAR) Guidelines (DPE 2022) and the Western Sydney Aerotropolis Development Control Plan (DCP) and provides indicative costs for management actions.

1.2. Scope and Objectives of the Vegetation Management Plan

The overall objectives of this VMP are to improve ecological health and integrity, maintain and enhance habitat values within the VMP area. This includes the revegetation of Forest Red Gum – Rough-barked Apple grassy woodland trees, shrubs, and grasses throughout the identified VMP area.

This VMP covers an establishment period (estimated to be 6-months) and a (Project length) maintenance period, or until the objectives and performance criteria outlined in this VMP are met. The objectives for the VMP area summarised in Table 1.

Table 1: VMP Objectives

Objectives	Approach
Reinstate native vegetation along the trunk drainage system and maintain ecological health (species composition and structure) within 5 years	● Rehabilitate and revegetate the Riparian corridors using appropriate native species. ● Control weeds and prevent new outbreaks. ● Assist in the natural regeneration of species. ● Addition of logs and artificial hollows
Improve ecological health and integrity	● Control woody weeds. ● Maximisation of biodiversity and ecological values. ● Revegetate using appropriate native species. ● Undertake ongoing weed maintenance.

1.3. Preparation and implementation of this plan

This VMP has been prepared by a Restoration Ecologist/s with over 5 years' experience in environmental consultancy and a relevant Bachelor of Science degree. This VMP has been prepared in accordance with the NSW Government Guidelines for riparian corridors on waterfront land.

A suitably qualified and experience bush regeneration contractor is required to implement this VMP. They should be a member of the Australian Association of Bush Regenerators (AABR) or should possess the required qualifications and experience for membership. In addition to this, team leaders should have, as a minimum, a Certificate III in Conservation & Land Management or equivalent. The contractor will need to conduct best practice bush regeneration techniques as described by Buchanan (2009).



Figure 1: Site location

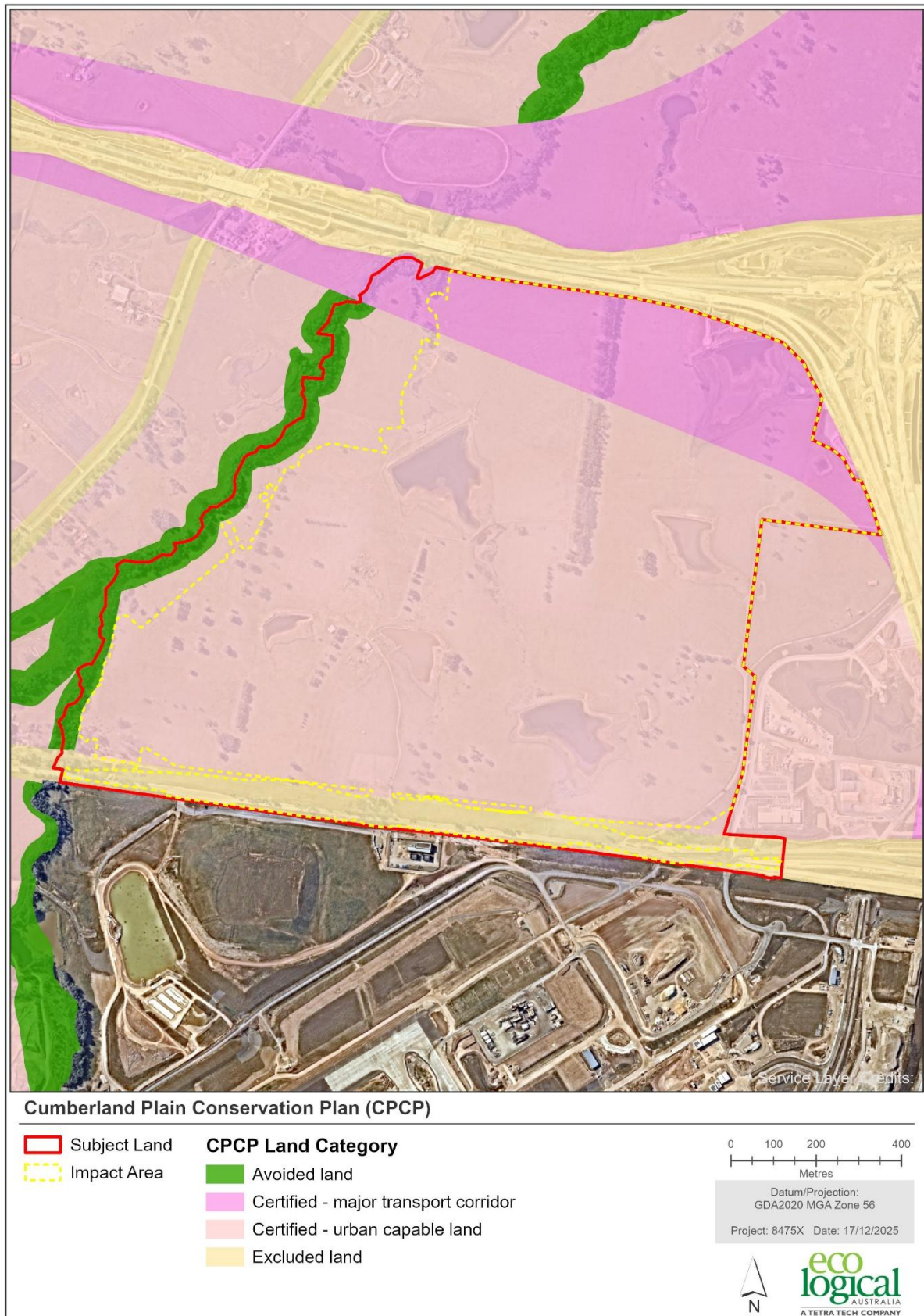


Figure 2: Development footprint

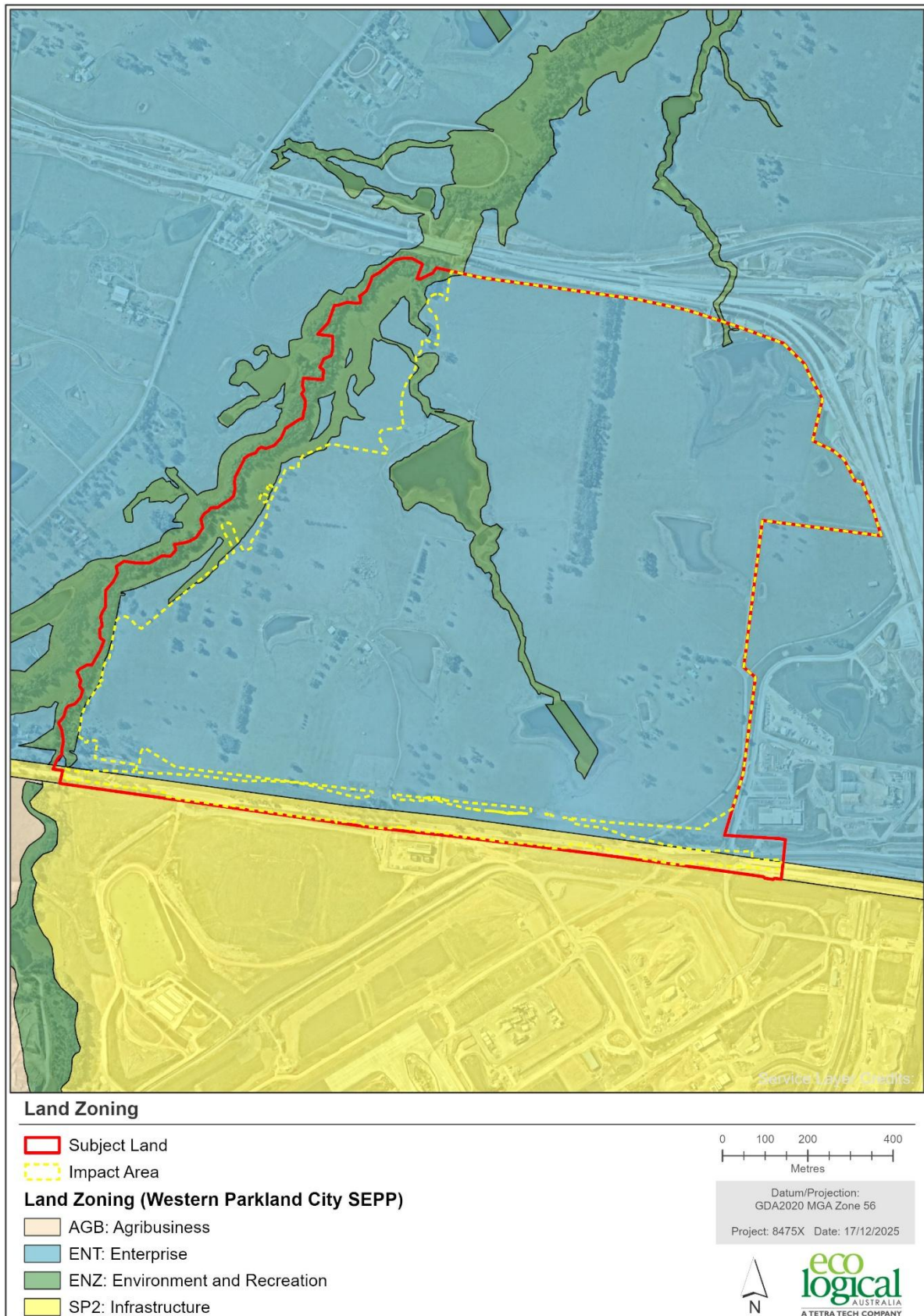


Figure 3: Land zoning (Western Parkland City SEPP)

2. Description of the environment

2.1. Location

The study area is legally defined as Lot 1 DP1306448, located at 1953-2109 Elizabeth Drive, Badgerys Creek NSW. The land within the study area is zoned as Enterprise Land (ENT) and Environment and Recreation (ENZ) under the *State Environmental Planning Policy (Precincts - Western Parkland City) 2021* (Western Parkland City SEPP), and forms part of the Cumberland Plain Conservation Plan (CPCP) Area.

The VMP area is located within and adjacent to the riparian corridor along the western boundary and the central drainage line including four existing farm dams.

Primarily, the VMP area is contained within areas identified as Priority Parkland under the DCP (Figure 4), or equivalent areas. Priority Parkland Areas do not require consideration with regard to the risk of wildlife attraction of plantings or landscaping. A total of 17 ha of Priority Parkland Area is present within the study area, with a total of 17.35 ha of the study area dedicated to management under the VMP. Approximately 0.76 ha of the VMP area is dedicated to low-density revegetation located outside Priority Parkland, VRZ and HBV areas.

2.2. Topography and hydrology

The site slopes gently in a north-west direction. The site contains ten farm dams and two watercourses along the western and northern boundaries of the site. Both watercourses identified within the site and four of the dams lie within ENZ land zoning under the Western Parkland City SEPP, these watercourses and a portion of the central larger dam are to be retained throughout the development of the site. As per the DDP (ELA 2024a), all dams will be removed prior to revegetation. Following dam removal as part of the bulk earthworks, the eastern watercourse will be modified to form part of a trunk drainage system that will connect to Cosgrove Creek in the north of the site.

2.3. Plant Community Types (PCTs)

Two Plant Community Types (PCTs) are currently present within or nearby the VMP area:

- PCT 4025 – Cumberland Red Gum Riverflat Forest
- PCT 3320 – Cumberland Shale Plains Woodland

These are mapped in Figure 4 and detailed in the following sections.

2.3.1. PCT4025 Cumberland Red Gum Riverflat Forest

This PCT is characterised by a tall to extremely tall sclerophyll open forest with a midstratum of soft-leaved shrubs and small trees with a densely populated groundcover layer along the alluvial flats and streams within the Cumberland plain. The canopy of this PCT almost always includes a combination of Red Gums and Cabbage Gums (*Eucalyptus tereticornis* or *E. amplifolia*) occasionally with an Apple (*Angophora floribunda* or *A. subvelutina*). The shrub layer of this PCT is primarily comprised of *Bursaria spinosa* with one or more *Acacia* species of which *Acacia parramattensis* is most common. Ground layer species within this PCT include a high proportion of grasses mixed with soft leaved forbs and ferns. Commonly found within the groundcover layer is *Microlaena stipoides*, *Dichondra repens*, *Oplimenus aemulus* and *Solanum prinophyllum*.

2.3.2. PCT 3320 Cumberland Shale Plain Woodland

This PCT is characterised by a tall sclerophyll open forest or woodland with a sparse midstratum of soft-leaved shrubs and small trees with a grassy groundcover found on the undulating Wianamatta Group shale plains of western Sydney. *Eucalyptus tereticornis*, *E. moluccana*, *E. crebra* and *E. fibrosa* often present to be the dominating tree species throughout this PCT. The sparse shrub and small tree layer is often comprised of *Bursaria spinosa* and one or more species of *Acacia* of which *Acacia parramattensis*, *A. decurrens*, *A. falcata* are most frequently seen. The groundcover layer of this PCT commonly comprises of *Microlaena stipoides*, *Themeda triandra*, *Dichondra repens*, *Brunoniella australis*, *Cheilanthes sieberi subsp. sieberi*, *Desmodium varians*, *Aristida vagans* and *Glycine tabacina*.

2.4. Existing vegetation

The site consists of a mixture of native and exotic species present throughout all strata. Throughout the riparian corridor, the VMP area is in relatively good condition with a large proportion of native groundcovers present under a mostly native canopy. The midstory within the riparian corridor is minimal consisting of regenerating *Casuarina glauca*, *Lucidum ligustrum*, *Lantana camara* and *Lycium ferocissimum*. Transitioning outwards from the riparian corridor into the open pastureland of the site, scattered native trees occur with minimal understorey primarily consisting of exotic species such as *Lycium ferocissimum*. The groundcover throughout the open pastureland consists primarily of exotic species with minimal native species prevailing along the border of the riparian corridor and under the scattered existing native canopy species. *Juncus acutus* is dominant throughout the site, mostly present in areas of increased soil moisture such as around all farm dams and some drainage lines.

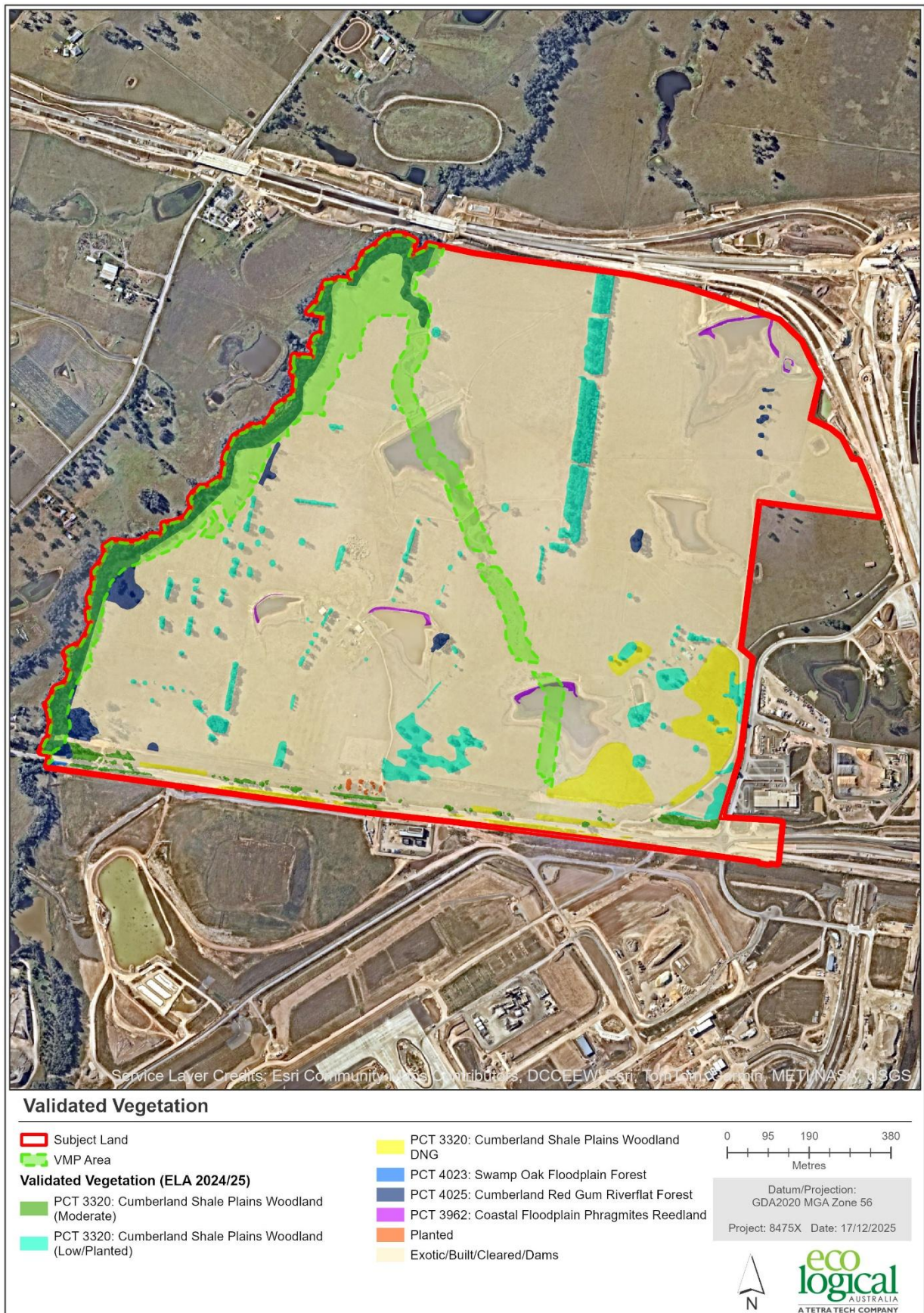


Figure 4: Plant community types (PCTs) in relation to the VMP area

2.5. Priority weeds

The *Biosecurity Act 2015* (BA Act) and regulations provide specific legal requirements for the state level priority weeds (Table 2). Under the BA Act all plants are regulated with a general biosecurity duty to prevent, eliminate, or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated, or minimised, so far as reasonably practicable.

Specific legal requirements apply to State determine priorities under the *Greater Sydney Regional Strategic Weed Management Plan 2023-2030*, while regional priorities include outcomes to demonstrate compliance with the general biosecurity duty and strategical responses in the region to achieve relevant management objectives (Greater Sydney LLS 2023). Weeds listed as 'other weeds of regional concern' under the plan warrant resources for local control or management programs and are a priority to keep out of the region. Inclusion in this list may assist Local Control Authorities and/or land managers to prioritise action in certain circumstances where it can be demonstrated the weed poses a threat to the environment, human health, agriculture etc.

Weed species identified during the field survey for this VMP includes eight (8) of Weeds of National significance and eight (8) weeds listed as Regional Level Priority. There were eight (8) weeds listed as other weeds of regional concern. The weeds present, their priority listing under the BA Act, the associated asset / value at risk and whether they are Weeds of National Significance (WoNS), area presented in Table 2. A full list of weeds recorded during the current field survey is provided in Appendix A.

Table 2: Priority weeds identified within the study area

Scientific Name	Common Name	WoNS	Regional level priority weeds	Other weeds of regional concern	Biosecurity Act 2015 listing
<i>Alternanthera philoxeroides</i>	Alligator weed	Yes	Yes	Yes	Environment
<i>Anredera cordifolia</i>	Madeira Vine	Yes	Yes	Yes	Environment
<i>Asparagus aethiopicus</i>	Ground Asparagus	Yes	Yes	Yes	Environment
<i>Asparagus asparagoides</i>	Bridal Creeper	Yes	Yes	Yes	Environment
<i>Lantana camara</i>	Lantana	Yes	Yes	Yes	Environment
<i>Lycium ferocissimum</i>	African Boxthorn	Yes	Yes	Yes	Environment
<i>Rubus fruticosus</i>	Blackberry	Yes	Yes	Yes	Environment
<i>Senecio madagascariensis</i>	Fireweed	Yes	Yes	Yes	Environment

3. Preliminary works

The following works will be required prior to vegetation management works being undertaken.

3.1. Temporary fencing and signage

The edge of the VMP area where it borders the development footprint is to be fenced with temporary construction fencing to prevent civil construction machinery from entering the VMP area unless under supervision from a suitably qualified ecologist or bush regenerator. If mature trees exist on the boundary of the VMP area, the temporary protection fencing should protect the entire Tree Protection Zone of the tree.

Signage is to be installed on the construction fencing that identifies that there is to be no entry into the VMP area without an ecologist or bush regenerator present.

The VMP area should be fenced permanently or similarly protected (for example, delineated by footpath) following completion of construction works to prevent any long-term impacts. Any fencing should incorporate suitable access for VMP and other works.

3.2. Soil and water management

An Erosion and Sediment Control Plan, preferably as part of a Construction Environmental Management Plan, must be developed and implemented prior to the commencement of any on-ground works. This plan must outline mitigation measures (e.g., silt fencing, drainage swale, etc.) to protect the natural creek line in the south of the VMP area from increased nutrient loads and weed seed incursion from site runoff. Additionally, the ten (10) existing farm dams present within the site are required to be dewatered to facilitate earthworks throughout the site. The dewatering of these dams are required to be undertaken adhering to the Dam Dewatering Plan (DDP) (ELA 2024a).

Prior to construction commencing, sediment fencing is to be installed at the base of the construction fencing to prevent sediment running into the VMP area and limit the spread of weed propagules in soil sediments during the construction period.

3.3. Preclearance and earthworks supervision and habitat enhancement

It is assumed that the civil contractor will undertake organise the removal of vegetation within the development footprint and where civil construction works are required within the VMP area.

Prior to vegetation removal a pre-clearance survey must be conducted to identify and mark all habitat features (i.e. hollow bearing trees (HBTs), stags, rocky outcrops etc.) within the development footprint or in the portion of the VMP area where construction works will be occurring. During construction activities, removal of habitat trees should be undertaken with a fauna ecologist or wildlife carer present to capture and release any displaced fauna in suitable habitat adjacent to the development footprint, with assistance provided by wildlife carers to attend to and care for injured fauna as needed. The removal of all habitat features must take place a minimum of 24 hrs following the removal of all other vegetation. Prior to the removal of habitat features, under the guidance of a suitably qualified ecologist the habitat feature must be tapped several times to observe for any signs of fauna. Following no observation of fauna the habitat feature can then be removed. Following removal, the qualified ecologist must inspect the habitat feature to ensure no fauna were harmed during the removal.

During works, all-natural timber (i.e., fallen logs and branches), hollow stems, sections of trees / large woody material (>30cm diameter) and suitable bush rock removed from within the development footprint/impact area must be retained and relocated, to be used as habitat structures within the VMP area, wherever feasible. This material provides microhabitat for fauna species, soil stability and nutrients cycling. The largest pieces (e.g. trunks and barrels) should be used within the MZ1: Low Flow Channel as large woody debris. These may need to be anchored down with wire and stakes to prevent movement. Exotic vegetation is to be taken off-site and should not be used in habitat enhancement. The placement of all fauna habitat augmentation/relocation is to be carried out under the supervision of a qualified ecologist.

All viable seed and genetic material present at time of clearance will be collected for plant propagation uses.

3.4. Pest control

It is the responsibility of the landholder to remove and protect the VMP area from all livestock within the area. Pest control is the responsibility of the land holder, if pest control is required installation is to be undertaken by relevant contractors in consultation with Local Land Services (LLS) and PCC.

3.5. Soil preparation prior to revegetation

Considerable chemical change can occur between soil A and B horizons, with some B horizons highly sodic and prone to deflocculation, erosion and water logging – which could significantly reduce revegetation works success. For this reason, excavation, shaping and re-levelling activities within the VMP area, if required, should take particular care with the removal, stockpiling and replacement of soil horizons/strata to achieve final soil profiles that are appropriate for plant survival. Works should also have plans in place to minimise and remediate soil compaction where construction works are taking place in the VMP area. Furthermore, environmental hygiene is highly recommended to prevent the introduction or the transfer of pathogens or noxious/WoNS seed. Safe Work Method Statements (SWMS) need to incorporate these measures for machinery and all pedestrians including work teams, reporters etc.

After all bulk earthworks, dam removal and shaping of the trunk drainage system are completed and vehicle movements excluded from the VMP area then surfaces should be treated with appropriate topsoils, compost and ameliorants to finished levels, ripped (where necessary) and cultivated to a light friable consistency. It is assumed that the Civil Contractor will undertake the soil preparation works but the exact requirements should be finalised in consultation with a suitably qualified and experienced Restoration Ecologist.

For this VMP, it is assumed that soil preparation will be required for all areas impacted by construction works including dam removal, bulk earthworks and trunk drainage installation (Zones 1, 2 and 6). An indicative amelioration profile has been provided in

Table 3, however this should be amended based on soil testing undertaken during the construction phase. In addition, after the removal of weeds additional areas may be identified as having deficient soils which are not suitable for revegetation. In this case these areas should be ameliorated as required to achieve suitable soil.

Table 3: Indicative soil preparation works requirements

Task
Form and shape subgrade to 300mm below final levels
Install 225mm of suitable site topsoil consistent with the natural local soils
Install 75mm compost complying with AS4454-2012
Undertake soil testing and install suitable ameliorants depending on the results. An indicative example of what might be required includes: 100g/m² Gypsum 20g/m² microbial soil conditioner (e.g., Bactivate granular or equivalent) 20g/m² quick-release multi-source 5:2:8 NPK organic granular fertiliser (e.g., Terralift TX10 + MYCORRHIZA or equivalent) 120g/m² slow-release microbial native 14:1:4 NPK granular fertiliser (e.g., Troforte M Native, or equivalent)
Work in topsoil, compost, and ameliorants together at 25% volume (3 parts soil plus 1 part compost)
Install to a depth of 300mm over subgrade
Rip and cultivate until light and friable

4. Vegetation management works

4.1. Vegetation management zones

The following zones will be required as part of rehabilitation works:

- Management Zone 1: Low Flow Channel
- Management Zone 2: Full revegetation
- Management Zone 3: Assisted revegetation
- Management Zone 4: Riparian revegetation
- Management Zone 5: Assisted regeneration
- Management Zone 6: Low Density Restoration

A total of 17.34 ha of management is proposed under this VMP. The management zones are shown in Figure 5 and described in the following sections.

4.1.1. Management Zone 1: Low Flow Channel

Zone 1 (0.98 ha), encompasses areas of an existing watercourse and drainage line including four farm dams (within and outside the Priority Parkland Areas). This area primarily consists of exotic groundcover species (*Juncus acutus* and *Paspalum dilatatum*). During construction and bulk earthworks, this entire zone is proposed to undergo reshaping to construct a low flow channel to manage stormwater from the development site. This low flow channel is part of a proposed naturalised trunk drainage channel to support Sydney Water stormwater infrastructure and water cycle management, with an effective vegetated riparian zone (VRZ).

Section 3.3 outlines the procedure for habitat enhancement within the VMP area. Suitable logs should be installed within this management zone to provide in stream debris which will act as aquatic habitat. The largest trunks and barrels should be utilised in this area and at minimum placed in piles no greater than 50m apart. Piles should contain, at minimum, the equivalent of 6m of timber greater than 30cm diameter. Timber, especially piles of smaller material, may need to be anchored with wire and stakes to prevent movement.

It is assumed that 100% of this zone will require revegetation following the completion of construction works.

The key management priorities within this zone are:

- Installation and maintenance of the VMP boundary fencing following construction activities where accessible.
- Removal of exotic species
- Installation of mulch/jute matting as required.
- Install tubestock of native riparian groundcover species as outlined in Table 4 and Table 5 using species listed in Appendix B
- Enhance habitat features (e.g., rocks, logs etc.) to achieve the specifications above
- Control of exotic species
- Monitor native vegetation and weed densities.

4.1.2. Management Zone 2: Full Revegetation

Zone 2 (9.77 ha), encompasses areas of an existing watercourse and drainage line including four farm dams (within and outside the Priority Parkland areas). This area primarily consists of exotic groundcover species (*Juncus acutus* and *Paspalum dilatatum*). During construction and bulk earthworks, the eastern portion of this zone (approximately 50%) is proposed to undergo reshaping to construct a Vegetated Riparian Zone (VRZ) to manage stormwater from the development site. Throughout the western portion of the site this management zone is primarily comprised of exotic pastoral grasses which require treatment prior to revegetation to support the function of Cosgrove Creek. It is assumed that 100% of this zone will require revegetation following the completion of construction works.

The Key management priorities within this zone are;

- Installation and maintenance VMP boundary fencing following construction activities, where accessible.
- Installation of mulch/jute matting as required.
- Install tubestock of native tree, shrub and groundcover species as outlined in Table 4 and Table 5 using species listed in Appendix B
- Irrigation of native tubestock until established and as needed ongoing.
- Enhance habitat features (e.g., rocks, logs etc.) where suitable
- Control of exotic grasses and other species
- Monitor native vegetation and weed densities.

4.1.3. Management Zone 3: Assisted Revegetation

Zone 3 (0.66 ha), encompasses areas of existing vegetation comprised of a mixed native and exotic groundcover with a native canopy. Midstory species are present at low proportions throughout this management zone and will require installation of a shrub layer and reduced planting of groundcover species where exotic species have been removed. Due to the scattered nature of native resilience, it is assumed that 100% of this zone will require revegetation following the completion of weed control.

The key management priorities within this zone are:

- Install and maintain VMP boundary fencing where accessible
- Removal of exotic species
- Promote native species regeneration where present
- Install mulch/jute matting as required.
- Install tubestock of native shrub and groundcover species as outlined in Table 4 and Table 5 using species listed in Appendix B
- Irrigation of native tubestock until established and as needed ongoing
- Enhance habitat features (e.g., rocks, logs etc.) where suitable
- Control exotic grasses and other species
- Monitor native vegetation and weed densities

4.1.4. Management Zone 4: Riparian revegetation

Zone 4 (0.91 ha), encompasses areas of existing native and exotic vegetation throughout all strata. Groundcover throughout this management zone is primarily comprised of *Ehrharta erecta* (Panic Veldt grass) and *Tradescantia fluminensis* (Wandering trad) with persisting native species present in low proportions. It is assumed that 80% of this zone will require revegetation following the completion of weed control, however an assessment on natural regeneration should be undertaken at this point to determine final revegetation requirements.

Section 3.3 outlines the procedure for habitat enhancement within the VMP area. Suitable logs should be installed within this management zone to provide in stream debris which will act as aquatic habitat. The largest trunks and barrels should be utilised in this area and at minimum placed in piles no greater than 50m apart. Piles should contain, at minimum, the equivalent of 6m of timber greater than 30cm diameter. Timber, especially piles of smaller material, may need to be anchored with wire and stakes to prevent movement.

The key management priorities within this zone are:

- Installation and maintenance of VMP boundary fencing where accessible
- Removal of exotic species
- Promote native species regeneration where present
- Installation of mulch/jute matting as required
- Install tubestock of native shrub and groundcover species as outlined in Table 4 and Table 5 using species listed in Appendix B
- Irrigation of native tubestock until established and as needed ongoing.
- Enhance habitat features (e.g., rocks, logs etc.) to achieve the specifications above
- Control of exotic grasses and other species
- Monitor native vegetation and weed densities.

4.1.5. Management Zone 5: Assisted regeneration

Zone 5 (2.70 ha) encompasses areas of native and exotic vegetation throughout all strata and illustrates canopy and groundcover resilience. However, throughout this management zone, native midstory species are sparse and will require replacement following initial primary and secondary weed control.

The key management priorities within this zone are:

- Installation and maintenance of VMP boundary fencing where accessible.
- Removal of exotic species
- Promote native species regeneration.
- Installation of mulch/jute matting as required.
- Establish native shrub species as outlined in Table 4 and Table 5 using the species listed in Appendix B
- Irrigation of native tubestock until established and as needed ongoing.
- Enhance habitat features (e.g., rocks, logs etc.) where suitable

- Control of exotic grasses and other species
- Monitor native vegetation and weed densities.

4.1.6. Management Zone 6: Low density revegetation

Zone 6 (0.72 ha) encompasses areas of existing exotic pasture which are (a) outside of the riparian corridor, (b) outside the Priority Parkland Area and (c) do not contain any existing native vegetation. These areas are proposed to be landscaped considering their location in relation to the rest of the VMP area, and to provide a transition zone between open space landscaping and full bushland regeneration.

DCP controls relating to landscaping do not apply to Priority Parkland Areas. In areas outside of the Priority Parkland Areas, landscaping (and restoration under this VMP) must consider the requirements of the Aerotropolis DCP. There are several conflicting objectives set out by the Phase 2 DCP relating to canopy cover, Connecting with Country, urban heat reduction and restoration of natural waterways – with the important aim to support safe airport operations by reducing the attractiveness of wildlife habitat, thereby reducing the risk of bird and bat strike.

Under Zone 6 management, outside the VRZ and Priority Parkland, revegetation is proposed to restore a modified groundcover layer with reduced density of tree and shrub species. In addition to this reduction, tree and shrub species should be planted in such a way that diversity is increased and tubestock of the same species are not planted next to each other, in order to reduce large areas of homogenous foraging habitat which may be preferred by wildlife. The guiding principle of Zone 6 is to mitigate wildlife hazard assessment outcomes, while supporting the adjacent riparian corridor along Cosgroves Creek and requirements for offsets under the Riparian Guidelines (DPE 2022). For example, the use of clumping grasses such as *Lomandra* sp. is not recommended throughout this management zone, as these species can provide habitat for small mammals increasing the likelihood of carnivorous avian fauna to occur on the site. The relationship between wildlife hazard and the VMP area is described in the separate Wildlife Hazard Assessment report (ELA 2024d).

The key management priorities within this zone are:

- Minimise attractiveness of the habitat for wildlife through lower density and diverse plantings
- Install and maintain VMP boundary fencing following construction where relevant
- Removal of exotic species
- Promote native species regeneration.
- Installation of mulch/jute matting as required.
- Install tubestock of native tree, shrub and groundcover species as outlined in Table 4 and Table 5 using species listed in Appendix B
- Irrigation of native tubestock until established and as needed ongoing.
- Control of exotic grasses and other species
- Monitor native vegetation and weed densities.

It is noted that with regard to the wildlife objectives under the DCP, the VMP including MZ5 will be subject to ongoing monitoring and adaptive management measures will be implemented as required. This may result in changes to the management zone compositions or management techniques (e.g. removal of food sources, thinning of vegetation) based on monitoring outcomes. This monitoring is to be carried out in accordance with the Wildlife Hazard Assessment & Management Report (ELA 2024c).

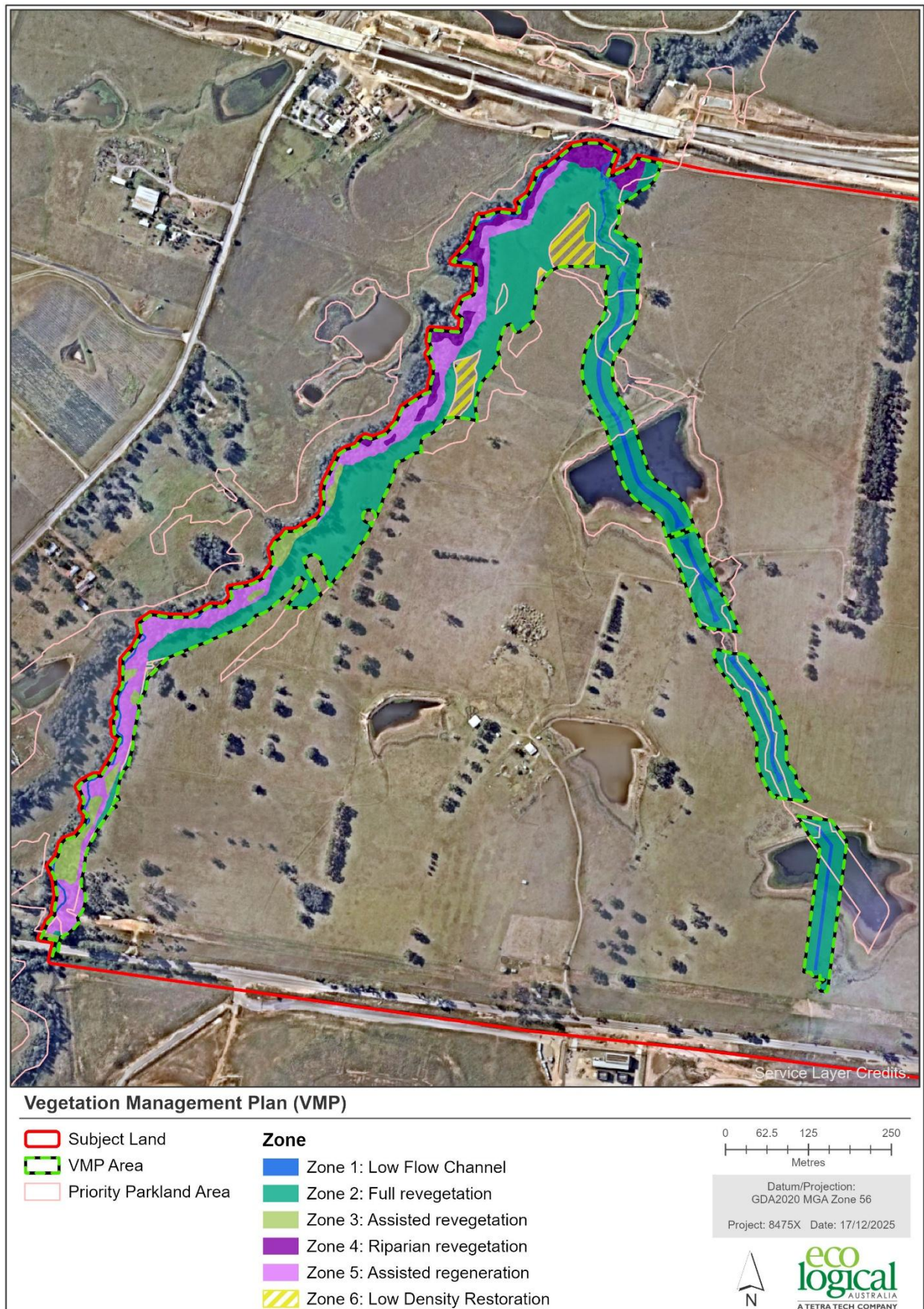


Figure 5: VMP management zones

4.2. Weed Control

4.2.1. Primary and secondary weed control

All weeds, including woody weeds will require treatment. Secondary and maintenance weed control will be required following revegetation. During these works, care must be taken to avoid any off-target damage to the natural regeneration of native species.

Primary weed control will include the removal of all woody and herbaceous exotic species outlined in Appendix A, specifically *Lantana camara*. Juvenile *Lantana sp.* plants can be hand-pulled, provided the whole root is removed. Large *Lantana sp.* plants can be treated using cut and paint method. Chemical and mechanical control techniques will be required in follow up treatments. Follow up treatments of woody weeds including *Lantana sp.* to control seedling growth will be required. For more information on specific weed control techniques, see Appendix C.

4.2.2. Maintenance

Following primary and secondary weed removal works, all areas will require ongoing maintenance to control weed regrowth from the soil seed bank. Maintenance work is to be undertaken by a qualified bush regeneration contractor(s) as per specifications provided in Appendix C.

Maintenance will be undertaken on a regular basis in the peak growing seasons (i.e., spring and summer), with less frequent visits necessary during cooler periods (i.e., autumn and winter). Maintenance work will include actions to encourage native regeneration in areas of lower resilience where it is not occurring naturally. These actions include techniques such as soil disturbance, niche seedling and transplanting, where appropriate.

4.3. Revegetation

All management zones will require revegetation as per the requirements identified in Table 5. Revegetation works will include planting of native groundcover, grass shrub and canopy species. All revegetation will be using tube stock and Hiko or Viro cells. The revegetation area within each management zone is shown in Figure 5.

Propagation material for planting stock should be sourced from pre-clearance collections, nearby locations, or from within the catchment region following current Florabank Guidelines (Harrison et al. 2021). Appropriate planning and timelines for sourcing propagation and planting material should be allowed for. Suggested species in Appendix B should be used as a general guide but other suitable species may be used if required.

Where required, mulch should be laid to a depth of 100mm. Mulching is required throughout the VMP to aid in the suppression of exotic species germination and increase soil organic matter content. The preference is to use site obtained mulch from the clearance of native vegetation, although if this is not possible, mulch can be externally sourced adhering to Australian Standards (i.e., AS4454 (2012): Compost soils conditioners and mulches). In addition, mulch should be comprised of un-composted wood preferably wood waste, with a particle size of about 15mm to 40mm with no fines and good air-filled porosity. Mulch should not contain any weed seeds, nor be derived from diseased trees or from any part of the tree lower than 1m above the ground. It is assumed site access will permit the delivery of mulch within 30m of the VMP area and spread via bobcat.

Jute matting will be required in areas of higher inundation of the site during high rainfall periods, particularly within Zones 1 and 4. Jute matting must be comprised of 100% biodegradable jute fibres

with a minimum weight of 680g/m² (~6mm thickness). Jute must be pegged with at least 3x150mm pins per m² and each roll overlapped by 100mm.

Planting densities for each management zone are provided in Table 5. A recommended planting list has been derived from the Phase 2 DCP and is provided in Appendix B of this report. Species included on this list are generally consistent Appendix B of the DCP wherever practical, however additional species have been proposed to be installed in order to support restoration, regeneration and full revegetation of PCT 4025. All plantings are to be sourced from local provenance stock in accordance with the Florabank guidelines (Mortlock 2000).

Table 4: Planting assumptions

Description	Zone Area (m ²)	Revegetation (%)	Revegetation area (m ²)	Jute Matting (%)	Mulch (%)	Jute Matting (m ²)	Mulch (m ²)
Zone 1: Low Flow Channel	9,808	100	9,808	100%	0%	10,786	-
Zone 2: Full revegetation	97,704	100	97,704	50%	50%	56,141	56,141
Zone 3: Assisted revegetation	6,558	100	6,558	0%	50%	-	3,279
Zone 4: Riparian revegetation	9,146	80	7,317	100%	0%	7,317	-
Zone 5: Assisted regeneration	27,039	100	27,039	0%	0%	-	-
Zone 6: Low Density Restoration	7,199	100	7,199	0%	100%	-	7,586
Totals	157,455		155,626			74,244	67,006

Table 5: Revegetation Densities

Description	Revegetation Area (m ²)	Revegetation densities (m ²)*				Totals
		Tree	Shrub	Herbs / Scramblers	Sedge / Grass	
Zone 1: Low Flow Channel	9,808	-	-	-	6	58,848
Zone 2: Full revegetation	97,704	1/100	1/50	1	4	491,452
Zone 3: Assisted revegetation	6,558	-	1/75	1	2	19,763
Zone 4: Riparian revegetation	7,317	-	1/50	1	4	36,729
Zone 5: Assisted regeneration	27,039	-	1/50	-	-	541
Zone 6: Low Density Restoration	7,199	1/200	1/100	2	2	28,904
Totals	155,626	1,013	2,801	125,977	506,446	636,237

*REVEGETATION REQUIREMENTS TO BE REASSESSED FOLLOWING THE COMPLETION OF INITIAL WEED CONTROL WORKS

5. Implementation schedule

5.1. Implementation schedule

The VMP area will be managed with an establishment period assumed to be 6-months and a five-year maintenance period.

An indicative implementation schedule has been provided in Table 6.

Table 6: Indicative Implementation Schedule

Task	Establishment	Year 1				Year 2				Year 3				Year 4				Year 5			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Preliminary Works																					
Site marking out/fencing																					
Earthworks																					
Revegetation																					
Seed collection, cleaning, storage																					
Site preparation																					
Jute matting / mulch																					
Tubestock																					
Replacement tubestock																					
Irrigation																					
Weed control																					
Establishment																					
Maintenance (years 1 - 2)																					
Maintenance (years 3 – 5)																					
Associated works																					
Monitoring and reporting																					

Key:

Civil construction activities

Vegetation management works

5.2. Adaptive management

As this is a long-term project that will be implemented over the entire length of project, an adaptive management approach will be implemented that enables the successful contractor to learn from and respond to successful and unsuccessful techniques used on the site. In its simplest form, this may include the substitution of species identified in the planting table or for undertaking advanced direct seeding techniques in place of manual planting techniques for revegetation works.

The success of the works will be determined by meeting the performance criteria identified in Table 7. Contractors have the flexibility to implement different techniques to those specified here providing that performance criteria are met. Any major departures from the VMP or proposed changes to performance criteria must be undertaken after the opportunity for inspection with PCC and approved in writing by DPHI.

5.3. VMP management after the initial five-year period (in perpetuity)

The VMP is to be re-evaluated upon completion of all works described within this VMP and at least every five years after that to ensure the site meets the performance criteria. Surveys at these inspections is to include both priority and environmental weed populations. Areas that do not conform to the performance criteria at the completion of works area required to be rehabilitated using the methods outlined within this VMP and may result in the extension of the VMP management period for a further five years.

5.4. Training

Construction staff will require training/inductions into the requirements of this VMP, including the location and requirements of tree/vegetation protection zones.

6. Monitoring and reporting

6.1. Photo monitoring

Photo monitoring points should be set-up using a permanent reference point to provide a visual reference of changes in the vegetation. Photo monitoring to include:

- Set up a minimum of 14 photo monitoring points within the VMP area with a minimum of two photo monitoring points in each zone, plus an additional two points in Management Zone 2.
- Mark the photo point with a six-foot star picket and map the location and bearing of each photo point.
- Take a digital photo of each photo point with the whole length of the star picket visible in the photo to act as a reference point; and
- Organise the digital photos logically with each image labelled with a unique reference number indicating the location of the photo point, the direction of the photo and the date the photo is taken.

Photo monitoring should be undertaken at the start and completion of establishment works, biannually in Year 1 and 2 and then annually until the completion of the project.

6.2. Vegetation surveys

Quadrat data points will be set up within the VMP area to monitor changes in the vegetation through time. Quadrat data should be collected from each photo point location. The quadrat data forms the baseline for monitoring against the performance criteria for the duration of the VMP. Floristic plot data is to be collected including species richness, cover and abundance in a 5 x 5 m minimum sized quadrat.

Quadrat data should be collected at the start and completion of establishment works, biannually in Year 1 and 2 and then annually until the completion of the project.

6.3. Progress reports

Progress reports are to be provided at the end of the establishment period, biannually in Year 1 and 2, and then annually until the completion of the project. This reporting includes the results of the monitoring actions specified in **Section 6.1** and **Section 6.2** and a description of the works that have been undertaken. These reports are to be submitted to PCC. Reports will include at a minimum:

- The time period the report relates to,
- Qualifications and experience of contractors,
- Certification of seed and local provenance stock,
- A summary of works carried out within the period including:
 - Date and time of site visits,
 - Works completed on the site at each visit,
 - A table detailing total person hours for each task carried out on-site,
 - Methods of weeding undertaken and details of herbicide use,
 - Numbers of tube stock planted if applicable,
 - Methods implemented for Assisted Natural Regeneration,

- Photo monitoring results to date,
- A description of any problems encountered in implementing the works outlined in this VMP and how they were overcome,
- Any observations made, including new plant species recorded (native and weed species), comments on rates of regeneration and any problems which impact on the implementation of the VMP,
- If applicable, the result of the implementation works in relation to the relevant performance criteria.

6.4. Performance criteria

The performance criteria are detailed in Table 7.

Failure to meet these performance criteria will mean that the maintenance period will be extended until they are achieved. Therefore, maintenance must continue until PCC agrees that the objectives and performance criteria have been met and the maintenance period has concluded. The author of this VMP, or an equally qualified and experienced person, must prepare a statement certifying the compliance of the performance criteria at the end of the VMP period.

If monitoring indicates that the VMP tasks are not resulting in achievement of the performance criteria, the task program will be revised. HB&B Property and the bush regeneration contractor, in consultation with PCC can adapt these criteria as required in response to the success of rehabilitation works.

The following performance criteria will need to be achieved in perpetuity:

- Across the VMP area, <2 % priority weeds cover and <5 % environmental weeds cover.
- No infiltration by exotic lawn species into the VMP area,
- No dumped garden waste within the VMP area,
- No patches of the VMP greater than 2m x 2m without any surviving natives or with significant erosion present.

Table 7: Performance Criteria

Zones	Establishment	Year 1	Year 2	Year 3	Year 4	Year 5
All Zones	Commencement of all tasks outlined in the VMP or evidence of planning for their implementation. Civil construction works: • All Construction and sediment fencing installed. • Information signage installed. • Any removal of vegetation in the VMP area for construction works, completed under the supervision of a qualified ecologist. • Installation of habitat features in MZ1 and MZ4 at minimum and other zones as suitable • All earthworks completed under the supervision of an ecologist or bush regenerator. • All rubbish and debris and debris are removed. • All soil preparation works completed to provide suitable conditions for revegetation. Vegetation management works: • Revegetation, where required, is to be undertaken with a minimum of 50% of the benchmark levels for species diversity provided in Table 8 for each strata • 85% survival of revegetation or equivalent regeneration and no areas with more than 2 m x 2 m without surviving native plants • Maintenance replanting is to replace plants by the same species or where that species is unavailable with the same growth form (e.g., tree for tree) and must not decrease species diversity. Any new species must be from the community being emulated and of local provenance. • Treatment of any new weed infestations • No woody weeds present capable of producing seed. • No erosion or sedimentation beyond the boundary of the development lot • Monitoring and reporting undertaken in accordance with Section 6					
All Zones	Treat 100% of priority weeds Treat 95% of other weeds	No greater than 15% cover by priority weeds No greater than 20% cover by all weeds	No greater than 10% cover by priority weeds No greater than 15% cover by all weeds	No greater than 10% cover by priority weeds No greater than 15% cover by all weeds	No greater than 5% cover by priority weeds No greater than 10% cover by all weeds	No greater than 2% cover by priority weeds No greater than 5% cover by all weeds
Zone 1,2 and 4	Undertake all revegetation as per VMP	Native groundcover no less than 40% of non-rock areas	Native groundcover no less than 50% of non-rock areas	Native groundcover no less than 60% of non-rock areas	Native groundcover no less than 70% of non-rock areas	Native groundcover no less than 80% of non-rock areas
Zones 3 and 5	Undertake all revegetation as per VMP	Native groundcover no less than 30% of non-rock areas	Native groundcover no less than 40% of non-rock areas	Native groundcover no less than 50% of non-rock areas	Native groundcover no less than 60% of non-rock areas	Native groundcover no less than 70% of non-rock areas

Zones	Establishment	Year 1	Year 2	Year 3	Year 4	Year 5
Zone 6	Undertake all revegetation as per VMP	<u>Native cover</u> Native groundcover no less than 40% of non-rock areas Native canopy cover no more than 50% of benchmark Native shrub cover no more than 50% of benchmark	<u>Native cover</u> Native groundcover no less than 50% of non-rock areas Native canopy cover no more than 50% of benchmark Native shrub cover no more than 50% of benchmark	<u>Native cover</u> Native groundcover no less than 60% of non-rock areas Native canopy cover no more than 50% of benchmark Native shrub cover no more than 50% of benchmark	<u>Native cover</u> Native groundcover no less than 70% of non-rock areas Native canopy cover no more than 50% of benchmark Native shrub cover no more than 50% of benchmark	<u>Native cover</u> Native groundcover no less than 80% of non-rock areas Native canopy cover no more than 50% of benchmark Native shrub cover no more than 50% of benchmark

Table 8: PCT benchmark conditions

PCT ID	PCT Common name (community) (BioNet 2024)	Species richness			Cover (%)		
		Canopy	Shrub	Ground cover	Canopy	Shrub	Ground cover
4025	Cumberland Red Gum Riverflat Forest	4	8	22	22	22	75

7. Cost

The cost of implementation for the five-year period is approximately **\$4,575,000** exclusive of GST and CPI. An indicative annual costing timeline for the establishment period to Year 5 is provided in Table 9. Costs should be reassessed at the end of Year 2 based on the results of the management undertaken to that point. Rates and costs are based on typical commercial rates. Assumptions that have been made regarding the estimation of costs have been outlined below.

7.1. Construction and preparation work

It is assumed that all soil preparation works and vegetation clearing for construction works within the VMP footprint, including primary weed removal, will be undertaken by the civil contractor under the supervision of a qualified Ecologist or Bush Regenerator. No costs have been provided in this VMP for the soil preparation, vegetation clearing or supervision by a suitably qualified and experienced restoration ecologist.

Preliminary and construction phase activities are identified in Section 3 and have not been included in Table 9.

7.2. Vegetation management works

7.2.1. Site preparation techniques

Prior to mulching and revegetation, all exotic vegetation must be treated and controlled to an acceptable standard. It is assumed that all zones will require soil preparation and installation of mulch, which has been included in the VMP costs provided.

7.2.2. Weed control techniques

Bush regeneration contractors will implement the weed control treatments identified in this VMP. These works have been estimated to cost **\$2,850** for a team of four bush regenerators, including a supervisor, per day. The cost of bush regeneration works includes the costs of herbicide, vehicles and equipment which are required to implement the VMP.

Specific weed control techniques are available in Appendix C

7.2.3. Revegetation treatments

Bush regeneration contractors will implement the revegetation treatments identified in this VMP. Tube stock costs have been budgeted at an estimated **\$5.50** per tree and shrub including planting and \$2.50 per herb, grass, sedge, and groundcover including planting.

A total of approximately **585,000** plants are assumed to be required to achieve the densities identified in the VMP, plus a 15% rate for replacement plantings to be installed in Year 1 and 2 of the VMP period.

7.2.4. Seed collection

Budget for the collection of seed has been included as a separate task. This is an indicative figure and does not consider seasonal and annual climatic variation which may increase or decrease the efficiency of seed collection. If further seed collection works are required, this may be an addition cost.

7.2.5. Monitoring and reporting

Monitoring and reporting can be undertaken either by the bush regeneration contractor or by the project ecologist. This includes:

- The initial set up of the photo points and conducting the baseline surveys at the beginning of the establishment period
- Preparing monitoring reports, including photo points and vegetation surveying at the end of the establishment period, biannually for Year 1 and 2 and then annually until the end of year 5

7.2.6. Pest control

Costs for pest control works over the length of the maintenance period are difficult to predict and as such have not been included in the costings. The need and level of pest control works will be assessed in the monitoring reports and an approach will be determined in consultation with PCC and LLS.

Table 9: Indicative VMP implementation costs

Treatment	Establishment	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Revegetation							
Seed collection, cleaning, storage	\$ 63,624	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 63,624
Site Preparation	\$ 106,522	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 106,522
Jute Matting / Mulch	\$ 984,301	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 984,301
Tubestock	\$ 1,327,953	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,327,953
Replacement tubestock	\$ -	\$ 99,596	\$ 99,596	\$ -	\$ -	\$ -	\$ 199,193
Irrigation	\$ 106,932	\$ 12,580	\$ 6,290	\$ -	\$ -	\$ -	\$ 125,802
Weed control							
Establishment	\$ 178,826	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 178,826
Maintenance - Years 1-2	\$ -	\$ 312,996	\$ 256,088	\$ -	\$ -	\$ -	\$ 569,084
Maintenance - Years 3-5	\$ -	\$ -	\$ -	\$ 214,926	\$ 187,371	\$ 148,795	\$ 551,092
Associated costs							
Disbursements	\$ 17,883	\$ 31,300	\$ 25,609	\$ 21,493	\$ 18,737	\$ 14,879	\$ 129,900
Monitoring & Reporting	\$ 12,246	\$ 12,246	\$ 12,246	\$ 6,123	\$ 6,123	\$ 6,123	\$ 55,109
Totals	\$ 2,798,287	\$ 468,719	\$ 399,829	\$ 242,542	\$ 212,231	\$ 169,797	\$ 4,291,406

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Appendix A Existing Vegetation

Table 10: Native species identified on site

Botanical Name	Common Name
<i>Acacia parramattensis</i>	Sydney green wattle
<i>Adiantum</i> spp.	Maidenhair fern
<i>Adiantum atroviride</i>	Maidenhair fern
<i>Alternanthera denticulata</i>	Lesser Joy weed
<i>Angophora subvelutina</i>	Broad-leaved apple
<i>Asperula conferta</i>	Common Woodruff
<i>Austrostipa ramosissima</i>	Stout Bamboo Grass
<i>Bolboschoenus</i> spp.	
<i>Bothriochloa macra</i>	Red leg grass
<i>Brunoniella australis</i>	Blue Trumpet
<i>Bursaria spinosa</i>	Blackthorn
<i>Carex appressa</i>	Tall Sedge
<i>Casuarina glauca</i>	Swamp oak
<i>Clematis aristata</i>	Old mans beard
<i>Corymbia maculata</i>	Spotted Gum
<i>Cyperus gracilis</i>	Slender Flat-sedge
<i>Dichondra repens</i>	Kidney Weed
<i>Echinopogon ovatus</i>	Forest Hedgehog Grass
<i>Eragrostis leptostachya</i>	Paddock Lovegrass
<i>Eriochloa pseudoacrotricha</i>	Early spring grass
<i>Eucalyptus moluccana</i>	Grey Box
<i>Glycine tabacina</i>	
<i>Glycine clandestina</i>	Twining glycine
<i>Haloragis heterophylla</i>	Variable rasp wort
<i>Hardenbergia violacea</i>	False Sarsaparilla
<i>Hypericum gramineum</i>	Small St. john's wort
<i>Juncus usitatus</i>	Common Rush
<i>Lachnagrostis filiformis</i>	Blown grass
<i>Lobelia purpurascens</i>	White root
<i>Lomandra longifolia</i>	Spiny-headed mat-rush
<i>Melaleuca</i> spp.	
<i>Microlaena stipoides</i>	Weeping grass
<i>Oplismenus imbecillis</i>	Creeping beard grass
<i>Oplismenus aemulus</i>	Australian Basket Grass
<i>Paspalum distichum</i>	Water Couch
<i>Persicaria</i> spp.	*
<i>Plecanthus parviflorus</i>	*
<i>Poa affinis</i>	*
<i>Polymeria calycina</i>	
<i>Sigesbeckia orientalis</i>	

Botanical Name	Common Name
<i>Sporobolus creber</i>	Slender Rat's Tail Grass
<i>Themeda triandra</i>	Kangaroo Grass
<i>Wahlenbergia gracilis</i>	Blue bell

Table 11: Exotic Species identified on site

Botanical Name	Common Name
<i>Anredera cordifolia</i>	Madeira vine
<i>Araujia sericifera</i>	Moth vine
<i>Alternanthera philoxeroides</i>	Alligator weed
<i>Asparagus aethiopicus</i>	Ground asparagus
<i>Asparagus asparagoides</i>	Bridal creeper
<i>Aster</i> sp.	Aster
<i>Axonopus fissifolius</i>	Carpet grass
<i>Bidens pilosa</i>	Cobblers Pegs
<i>Biflora tentaculata</i>	
<i>Cardiospermum grandiflorum</i>	Balloon Vine
<i>Chenopodium album</i>	Fat Hen
<i>Chloris gayana</i>	Rhodes Grass
<i>Cirsium vulgare</i>	Spear thistle
<i>Conyza bonariensis</i>	Flax leaf fleabane
<i>Cynodon dactylon</i>	Couch
<i>Cyperus eragrostis</i>	Umbrella sedge
<i>Eragrostis curvula</i>	African lovegrass
<i>Ehrharta erecta</i>	Panic veldt grass
<i>Juncus acutus</i>	Sharp Rush
<i>Lantana camara</i>	Lantana
<i>ligustrum lucidum</i>	Privet
<i>Lotus criticus</i>	Cretan trefoil
<i>Lycium ferocissimum</i>	African Boxthorn
<i>Malva sylvestris</i>	Tall mallow
<i>Modiola caroliniana</i>	Red-flowered mallow
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African olive
<i>Oxalis corniculata</i>	creeping oxalis
<i>Oxalis latifolia</i>	
<i>Oxalis pes-caprae</i>	
<i>Paspalum dilatatum</i>	Paspalum
<i>Pennisetum clandestinum</i>	Kikuyu Grass
<i>Plantago lanceolata</i>	Plantain
<i>Rubus fruticosus</i>	Blackberry
<i>Rumex</i> spp.	Dock
<i>Senecio heterophylla</i>	
<i>Senecio madagascariensis</i>	Fireweed

Botanical Name	Common Name
<i>Senna pendula</i>	Senna
<i>Sida rhombifolia</i>	Paddy's lucerne
<i>Solanum sisymbriifolium</i>	Sticky nightshade
<i>Solanum mauritianum</i>	Wild tobacco bush
<i>Solanum pseudocapsicum</i>	Madeira winter
<i>Solanum pseudocapsicum</i>	Jerusalem Cherry
<i>Sonchus oleraceus</i>	Common sow thistle
<i>Sporobolus africanus</i>	Paramatta grass
<i>Sporobolus fertilis</i>	Giant parramatta grass
<i>Tradescantia fluminensis</i>	Trad
<i>Trifolium repens</i>	White clover
<i>Verbena bonariensis</i>	Purple top
<i>Xanthium spinosum</i>	Bathurst burr

Appendix B Recommended Revegetation

Stata	Botanical Name	Common name	Phase 2 DCP (Appendix B) Landscape Species List	Western Sydney Stormwater Scheme	Zone 1 (Low flow)	Zones 2-6 (Revegetation)
Trees	<i>Acacia decurrens</i>	Black wattle	Y	N		*
	<i>Acacia implexa</i>	Hickory wattle	Y*	Y		*
	<i>Acacia parramattensis</i>	Sydney Green Wattle	Y	Y		*
	<i>Allocasuarina littoralis</i>	Black she-oak	Y	N		*
	<i>Angophora floribunda</i>	Rough-barked Apple	Y*	Y		*
	<i>Brachychiton populneus</i>	Kurrajong	Y	N		*
	<i>Casuarina cunninghamia</i>	River oak	Y	N		*
	<i>Casuarina glauca</i>	Swamp Oak	Y	Y		*
	<i>Clerodendrum tomentosum</i>	Lolly bush	Y	N		*
	<i>Corymbia maculata</i>	Spotted Gum	Y*	Y		*
	<i>Eucalyptus amplifolia</i>	Cabbage Gum	Y*	Y		*
	<i>Eucalyptus crebra</i>	Narrow-Leaved Ironbark	Y*	Y		*
	<i>Eucalyptus elata</i>	River White Gum	Y*	Y		*
	<i>Eucalyptus eugenioides</i>	White Stringybark	Y*	Y		*
	<i>Eucalyptus fibrosa</i>	Red Ironbark	Y*	Y		*
	<i>Eucalyptus moluccana</i>	Grey Box	Y*	Y		*
	<i>Eucalyptus tereticornis</i>	Forest Redgum	Y*	Y		*
	<i>Melaleuca linariifolia</i>	Snow in Summer	Y*	Y		*
	<i>Melaleuca styphelioides</i>	Prickly-Leaved Paperbark	Y*	Y		*
	<i>Melia azedarach</i>	White Cedar	Y*	Y		*
	<i>Tristanopsis laurina</i>	Water Gum	N	Y		*
	<i>Acacia falcata</i>	Sickle Wattle	N	Y		*
Shrubs	<i>Acmena smithii</i>	Lilly Pilly	N	Y		

Stata	Botanical Name	Common name	Phase 2 DCP (Appendix B) Landscape Species List	Western Sydney Stormwater Scheme	Zone 1 (Low flow)	Zones 2-6 (Revegetation)
	<i>Breynia oblongifolia</i>	Coffee Bush	Y	Y		*
	<i>Bursaria spinosa</i>	Blackthorn	Y	Y		*
	<i>Daviesia ulicifolia</i>	Gorse Bitter Pea	Y	Y		*
	<i>Dillwynia sieberi</i>	Prickly-Parrot Pea	N	Y		*
	<i>Dodonaea viscosa</i>	Giant hop bush	Y	N		*
	<i>Indigofera australis</i>	Australian Indigo	Y	Y		*
	<i>Kunzea ambigua</i>	Tick Bush	Y	N		*
	<i>Ozothamnus diosmifolius</i>	Rice Flower	N	Y		*
	<i>Melaleuca decora</i>	White Feather Honey Myrtle	Y*	Y		*
	<i>Trema tomentosa</i>	peach bush	Y	N		*
Grasses and groundcovers	<i>Carex appressa</i> *	Tall Sedge	Y+	Y	*	*
	<i>Aristida ramosa</i>	Purple Wiregrass	Y+	Y		*
	<i>Aristida vagans</i>	Three awn Spear grass	N	Y		*
	<i>Arthropodium milleflorum</i> *	Vanilla Lily	Y	Y		*
	<i>Austrostipa ramosissima</i>	Stout Bamboo Grass	N	Y		*
	<i>Brunoniella australis</i>	Blue Trumpet	Y	Y		*
	<i>Centella asiatica</i>	Centella	N	Y		*
	<i>Chloris truncata</i>	Windmill Grass	Y+	Y		*
	<i>Chloris ventricosa</i>	Plump Windmill Grass	N	Y		
	<i>Clematis glycinoides</i> var.		Y	Y		*
	<i>Commelina cyanea</i>	Scurvy Weed	Y	Y		*
	<i>Cymbopogon refractus</i> *	Barbed Wiregrass	Y+	Y		*
	<i>Desmodium varians</i>	Slender Tick-trefoil	Y+	Y		*
	<i>Dianella longifolia</i> *	Smooth Flax Lily	Y+	Y	*	*
	<i>Dichelachne micrantha</i>	Short-hair Plume Grass	Y+	Y		*

Stata	Botanical Name	Common name	Phase 2 DCP (Appendix B) Landscape Species List	Western Sydney Stormwater Scheme	Zone 1 (Low flow)	Zones 2-6 (Revegetation)
	<i>Dichondra repens</i>	Kidney Weed	Y	Y		*
	<i>Echinopogon ovatus</i>	Forest Hedgehog Grass	Y	Y		*
	<i>Einadia hastata</i>	Berry Saltbush	Y	Y		*
	<i>Einadia trigonos</i> subsp.	Fish weed	N	Y		*
	<i>Entolasia marginata</i>	Boarded Panic	Y	Y		*
	<i>Eragrostis brownii</i>	Browns lovegrass	N	N		*
	<i>Eremophila debilis</i>	Winter Apple	Y	Y		*
	<i>Euchiton sphaericus</i>	Cudweed	N	Y		*
	<i>Ficinia nodosa</i>	Knobby Club Rush	Y+	Y	*	*
	<i>Geranium solanderi</i>	Native Geranium	N	Y		*
	<i>Glycine clandestine</i>	Twining Glycine	N	Y		*
	<i>Glycine tabacina</i>	Love Creeper	N	Y		*
	<i>Goodenia hederacea</i>	Forest Goodenia	Y	Y		*
	<i>Hardenbergia violacea</i>	Purple Coral Pea	Y	Y		*
	<i>Hibbertia diffusa</i>	Wedge Guinea Flower	N	Y		*
	<i>Imperata cylindrica</i> *	Blady Grass	N	Y		*
	<i>Juncus usitatus</i>	Common Rush	Y+	Y	*	*
	<i>Lepidosperma laterale</i> *	Variable Sword Sedge	N	Y		*
	<i>Lomandra filiformis</i> *	Wattle Mat-rush	Y+	Y	*	*
	<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Meadow Grass	Y+	Y		*
	<i>Oplismenus aemulus</i>	Creeping Beard Grass	Y+	Y		*
	<i>Oxalis perennans</i>	Grassland Wood- Sorrel	N	Y		*
	<i>Panicum simile</i>	Two Colour Panic Grass	N	Y		*
	<i>Paspalidium distans</i>	Shot Grass	N	Y		*

Stata	Botanical Name	Common name	Phase 2 DCP (Appendix B) Landscape Species List	Western Sydney Stormwater Scheme	Zone 1 (Low flow)	Zones 2-6 (Revegetation)
	<i>Poa labillardieri</i> *	Tussock Grass	Y+	Y		*
	<i>Pratia purpurascens</i>	Whiteroot	Y	Y		*
	<i>Solanum prinophyllum</i>	Forest Nightshade	Y	Y		*
	<i>Themeda australis</i> *	Kangaroo Grass	Y+	Y		*
	<i>Veronica cinerea</i>	Speedwell	N	Y		*
	<i>Viola hederacea</i>	Native Violet	Y	Y		*
	<i>Wahlenbergia gracilis</i>	Native Bluebell	N	Y		*
	<i>Wahlenbergia stricta</i>	Tall bluebell	Y	N		*

Y* = Only within 3km wildlife buffer, where supported by ecologist report, confirming landscape design minimises wildlife attraction (REFER TO ELA 2024C)

Y+ = Subject to monitoring and/or maintenance plan to ensure potential for wildlife attraction is managed.

*Clumping grass/sedge

Appendix C Techniques and Specifications

C1 Weed Control

Weed control involves a combination of mechanical, physical, and chemical techniques to remove the weeds and prevent regrowth. Weed control will be undertaken across the entire zone. A selection of the best suited weed control method within the site depends on a number of factors, including:

- The species or combination of weeds being targeted,
- The density of weeds present,
- Resources available (time, labour, equipment, and finances),
- weather condition on the day.

C1.1. Weed control techniques

Details of specific weed control techniques to be used such as cut-and-paint, scrape-and-paint, herbicide-spraying, and hand weeding are provided in Brodie (1999). The principles of bush regeneration and techniques to trigger natural regeneration are to be in accordance with the Bradley Method and other techniques described in Buchanan (2009). Management techniques for different types of weeds are provided below.

Annual grasses

Annual grasses should be hand removed or spot sprayed where isolated or in low concentrations. Larger patches of annual grasses may be slashed/brush cut in late spring to early summer, after flowering, but prior to seed set. For most species, slashing/brush cutting prior to late spring through to early summer will promote vigorous growth and should not occur. However, some annual grasses can grow and produce seed at any time of the year dependent on climatic conditions such as high rainfall and warm temperatures. Monitoring of annual species should be undertaken and if new growth occurs, the same treatment will be applied to the new growth to prevent seed production. Individual plants should be hand removed, bagged, and disposed of appropriately offsite.

Perennial grasses

Perennial grasses will be hand removed where isolated or in low concentrations. Larger patches may be slashed prior to seed production in spring or summer (depending on the growth cycle of the species) and the regrowth spot-sprayed 2-3 weeks later when it is actively growing and approximately 10 cm in length. Monitoring of these species will occur and if new seed production occurs, the same treatment will be applied again as required. However, slashing will not reduce the presence of exotic grasses on its own and must always be combined with targeted removal to reduce densities and allow for native regeneration. Individual plants should be hand removed, bagged, and disposed of at a registered green waste facility.

Woody weeds

Primary control of trees such as *Olea cuspidata* subsp. *europaea* following vegetation removal, should be implemented by using the cut and paint or drill and fill method using a non-selective herbicide. The most appropriate method to be used depends on the size of the individual to be removed and will be determined by the bush regeneration contractor. Primary weed control should use techniques that will not encourage flushes of secondary weed growth. All seedlings of woody weeds will be hand pulled or spot-sprayed with a non-selective herbicide.

Follow up treatment of woody weeds, including *Olea cuspidata* subsp. *europaea*, *lantana camara*, *Linguist rum lucidum* *Lycium ferocissimum* will be controlled by the cut and paint or drill and fill method using a non-selective herbicide.

The most appropriate method to be used depends on the size of the individual to be removed and will be determined by the bush regeneration contractor. Primary weed control should use techniques that will not encourage flushes of secondary weed growth. All seedlings of woody weeds will be hand pulled or spot-sprayed with a non-selective herbicide.

Creepers and climbers

The control of exotic vines should be managed by skirting at chest height then spraying the target once it is on the ground. This should be done with a dicot specific herbicide such as Grazon®. Follow up treatments will be necessary and should be done as the germinating vines are still saplings.

The control of creepers varies depending on the species. For the most part, seedlings will be hand pulled, while mature plants can be controlled by the stem-scrape method or spot spraying using a non-selective herbicide. The precise method to be used will be determined by the bush regeneration contractor depending on the species, size, and reproductive status of the individual. All vegetative material removed should be bagged, removed from site, and disposed of appropriately.

Herbaceous weeds

Herbaceous weeds will be hand pulled prior to flowering. Where large swaths of these species occur, they will be sprayed using a non-selective herbicide. If high densities of mature stands occur, weeds may be slashed first using a brush cutter and any subsequent regrowth sprayed. Regular monitoring of these species will be required to prevent seed production. All vegetative material that is pulled out and has the potential to regrow if deposited on ground will be bagged and removed from site.

Management of weed waste

All weed propagules, especially priority weeds, will be bagged and disposed of as directed by legislation at facility licensed to receive green waste. All weed waste without propagules will be composted onsite in small unobtrusive piles.

Herbicide use

The use of herbicide to control weeds should be carefully considered. Herbicide must only be used for the purpose described on the product label, as per the NSW *Pesticides Act 1999*. Herbicide use should assess potential long-term impacts of the technique, including whether the proposed works address the source of the weed infestation. However, herbicide application forms an important and useful component of an integrated weed management approach and can be the most appropriate method for the control and eventual eradications of some weed species.

Herbicide use should occur during the active growing season for plants to encourage the chemical uptake into the plant. The selection of herbicides should also consider the type of weed and the location. Where non-selective herbicides are required for use, glyphosate is the most suitable. A glyphosate-based herbicide, formulated for use near waterways, will be used if works require herbicide application near waterways, a (e.g., Roundup Biactive®).

Broad-leaf selective herbicide may be used as per the NSW Weed Control Handbook (DPI 2018). However, this type of herbicide is extremely toxic to aquatic life and must not be used in, or adjacent to, waterways.

Registration and records must be kept in accordance with the NSW *Pesticides Regulation 2017*.

C2 Revegetation works

Revegetation has the dual aim of both re-establishing the original native vegetation community at the site and reducing erosion along the length of the riparian corridor, which will carry greatly increased peak flows due to the increased run-off from the hard surfaces created by the associated residential development. Any plantings should consist of local provenance stock. Planting of Hiko for trees and shrub species and Hiko or Viro cells for grasses and other groundcover species is the preferred method. Planting should be done via a low impact method such as hand digging or hand auger. The holes dug for each plant should be at least 1.5x the width and 2x the depth of the root ball. Fertiliser should be added to each hole dug as per the label specifications. Water crystals or wetting agents should be added to each plant hole. This will increase the water holding capacity of the soil and reduce watering schedules. Initial irrigation of the plantings is essential to ensure that the soil forms around the root ball and air pockets are removed. This will be required unless sufficient rainfall (approx. 10mm) occurs on the day of planting.

Tree guards should be installed on each tree or shrub to protect seedlings from extreme weather (frosts and heat), herbivorous grazing and herbicide drift during maintenance works. Bio-degradable tree guards are recommended to protect the seedlings. Following the revegetation works, irrigation needs to be undertaken for at least 8 weeks following planting to ensure the establishment of the plants. The level of irrigation will be determined by rainfall and temperature experienced at the planting site.

A temporary irrigation system should be installed to assist in the establishment of vegetation. Timing of the planting of these areas will need to take into consideration surrounding civil works and erosion/sediment control requirements, these areas will not be planted until earthworks have been completed. A minimum rate of attrition of 10% is to be expected and should be allowed for.

Mulch can be derived from vegetation removed from the development area, if available. Alternately, mulch should be comprised of un-composted wood (preferably wood waste), with a particle size of 15 mm to 40 mm, with no fines, and good air-filled porosity. Mulch should not contain any weed seeds, nor be derived from diseased trees or from any part of the tree lower than 1 m above the ground. Mulch, where required, should be installed to a depth of 100 mm.

Jute matting, where required, must be comprised of 100% biodegradable jute fibres with a minimum weight of 680g/m² (~6 mm thickness). Jute must be pegged with at least 3 x 150 mm pins per m², and each roll overlapped by 100 mm.

Seed collection

For the growth of the plants used in the revegetation works, seed must be collected from local provenance species. Groundcovers, shrubs and trees should be collected as within close proximity (i.e., <20km) to the site. However, soil type, climate and aspect of the collection site(s) should also be considered. Native grasses typically have much larger dispersal mechanisms and are to be collected from within the Sydney basin.

Where species identified in this VMP cannot be sourced, they may be substituted for other species as identified by Tozer (2003). Species must be substituted with species of a similar form, e.g., trees for tree, grasses for grasses, etc. Only wild native species are to be used. Plants are not to be substituted with horticultural varieties under any circumstances.

Record keeping of seed collection and planting locations are to follow the Florabank guidelines (Mortlock 2000). A Section 132C licence under the NSW *National Parks and Wildlife Act 1974* will be required to undertake seed collection works.

C3 Bush regeneration contractors

The rehabilitation and revegetation requirements detailed in this VMP must be implemented under the supervision of the supervising Ecologist or Bush Regenerator.

The supervising Bush Regenerator should be a member of AABR or should possess the required qualifications and experience for membership. In addition to this, they should have, as a minimum, a Certificate III in Conservation & Land Management or equivalent. The contractor will need to conduct best practice bush regeneration techniques as described by Buchanan (2009).

A flexible approach to this site is recommended since techniques may need to be changed or modified to suit site conditions. This approach is consistent with adaptive management and allows the contractor to develop and build on site knowledge whilst implementing this VMP. Monitoring will assist in the development of the VMP actions in subsequent years.

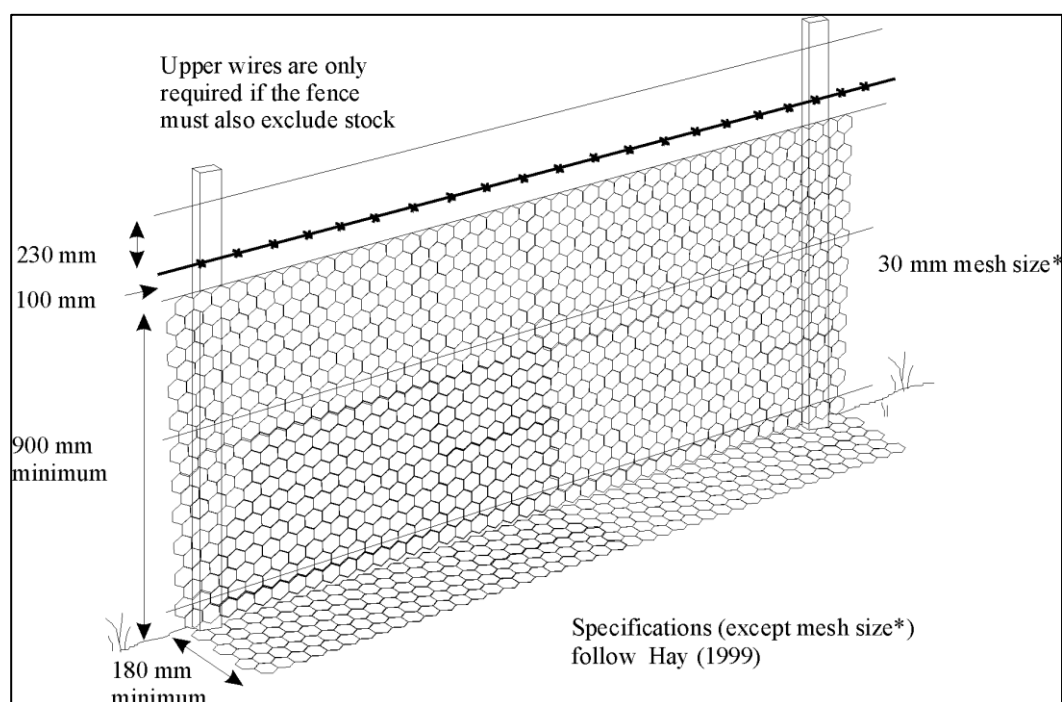
C4 Hygiene protocols

To avoid introducing soil pathogens / diseases, in particular *Phytophthora cinnamomi* (Root rot disease), onto site a hygiene protocol should be undertaken as per the guidelines developed by the Royal Botanic Gardens in 'Best Practice Management Guidelines for *Phytophthora cinnamomi* with the Sydney Metropolitan Catchment Management Authority.'

For Bush Regenerators all tools and boots should be washed down and thoroughly cleaned of soil / mud using a solution of water and disinfectants prior to undertaking works onsite. All machinery should be thoroughly cleaned of all soil / mud / debris prior to working within the VMP area.

C5 Rabbit exclusion fencing

Rabbit proof fencing may be required to be installed to the guidelines in the Commonwealth Department of the Environment Catalogue of fence designs. The fencing will need to be a minimum of 900mm high, with a 180 mm skirt as per the figure below.



Recommended fencing for rabbit exclusion (DoEE 2004)

