Attachment 10

Regional Open Space Management Plan (BES, 2020)

LOTS 2, 3 AND 4 MINNINUP ROAD, DALYELLUP

REGIONAL OPEN SPACE MANAGEMENT PLAN

Prepared for

[redacted]

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EXECUTIVE SUMMARY

Introduction

Mr Colin Piacentini has received WAPC subdivision approval for Lots 2, 3 and 4 Minninup Road, Dalyellup (the subject land). The subject land is bordered to the south and west by newly-created Regional Open Space (ROS), which occupies Lots 6 and 317 Minninup Road. The ROS has a total area of 98 hectares and was formerly owned by Mr Piacentini before being acquired by the WAPC in 2016.

Lot 6 consists mostly of a large Resource Enhancement Category wetland, with Quindalup dunes to the west. Lot 317 comprises mostly upland Spearwood dunes, with smaller areas of wetland and Quindalup dunes.

The native vegetation of the ROS consists of parkland-cleared Tuart-Jarrah-Marri woodland on the uplands and paperbark woodland and sedges in the wetland. The vegetation is mostly heavily degraded as a result of decades of clearing and cattle grazing. The exceptions are some areas in the western part of the wetland where paperbark woodlands in very good to excellent condition persist, and a few areas in the Quindalup dunes to the west with Tuart woodland in good to very good condition.

The ROS contains potential but poor-quality habitat for black cockatoos and Western Ringtail Possums. Extensive revegetation of both wetland and upland areas is proposed in order to improve the habitat values for these species.

Potential Impacts and Threats

Development of the subject land will bring an estimated human population of about 2,870 people into the area immediately north and east of the ROS. This will create threats to the ROS including:

- The Maidment Parade road reserve will be battered up to 20m into the eastern edge of Lot 6 (the wetland buffer) in order to meet the levels of existing external roads.
- Development may affect the quantity and quality of runoff and groundwater entering the wetland.
- Increased human presence may bring an increase in the number of dogs and cats in the area.
- Increased vegetation cover and human population may increase the risk of fire.
- The increased population may lead to an increase in antisocial behaviour such as littering, drinking, arson, illegal vehicle access and vandalism.

ROS Management

The management of the ROS will focus on revegetation, fauna habitat enhancement, access management and fire protection. Features of the management will include:

- Extensive revegetation will markedly increase the area, density and habitat value of native vegetation in the ROS.

- Approximately 28ha of land in Lot 317 will be intensively revegetated with overstorey (Tuart, Jarrah, Marri), mid-storey (Peppermint, Banksias, Paperbarks) and understorey (shrubs and sedges) species. The revegetation will create a continuous connected canopy from west to east across Lot 317 to provide high-quality habitat for Western Ringtail Possums and Black Cockatoos.

- A further 12.7ha of revegetation in the wetland and buffer will create further habitat and help to restore the natural values of the wetland while also creating a significant visual landscape element for the adjacent development.

- Access to the ROS will be discouraged by the placement of a 1.2m high chain link fence along the boundaries of the road reserves abutting the ROS. The fences will be fitted with signs requesting people to keep themselves and their pets out of the ROS.

- Shared paths will be constructed on the development side of the fences to provide views of the ROS. On Maidment Parade, a vegetated overflow swale will be positioned between the path and the fence to further discourage entry to the ROS.

- Gates will be positioned at intervals along the fences to provide access for emergency and management vehicles.

- Fire hydrants will be located at 100m intervals along the roads fronting the ROS. Further fire protection will be provided by the high level of public surveillance created by houses fronting the ROS.

Implementation and Monitoring

Rehabilitation of the wetland will begin before the first stage of subdivision works with the commencement of ground preparation and planting trials. The bulk of the rehabilitation and capital works including fencing and path construction will be completed in conjunction with the subdivision works. These works will be undertaken and funded by the developer.

The developer will maintain and monitor the rehabilitation works described herein and will maintain them for five years after the completion of the works. The revegetation works in Lot 317 are governed by the conditions of the EPBC approval and will be

managed for twenty years. This may be undertaken by Mr Piacentini or, subject to agreement on funding, by the DBCA.

Success Criteria

Success of the ROS management will be indicated by:

- Establishment of self-sustaining vegetation in the habitat corridor with a density of at least 16 overstorey trees, 320 mid-storey trees (480 in high-density patches) and 320 understorey species per hectare in good health after five years, as set out in the Revegetation Management Plan (Report no. J07013i).
- An increase in the assessed habitat value of vegetation in the habitat corridor for black cockatoos (from a start quality of 5) and Western Ringtail Possums (from a start quality of 2) according to the scale employed in the DEE Offset Guide.
- Establishment of self-sustaining vegetation in good health, including at least 80% survival of planted vegetation, in the wetland and buffer after five years.
- Vegetation height and density in the wetland buffer remains in the "shrubland" classification (shrubs below 2m height; trees >15m spacing).
- No or few fires in the ROS.
- No significant damage to the ROS by foot traffic.
- No illegal vehicle (including motorcycle) traffic in the ROS.
- No significant occurrence of dogs or cats in the ROS.
- A low level of litter in the ROS.

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1.0 INTRODUCTION

Mr Colin Piacentini is the owner of Lots 2, 3, 4 and 5 Minninup Road, Dalyellup (the subject land). The subject land is zoned Urban under the Greater Bunbury Region Scheme (GBRS) and Urban Development under the Shire of Capel Town Planning Scheme (TPS) No. 7. In February 2018 the WAPC approved a subdivision application for Stage 1 of the subject land (comprising Lots 2, 3 and 4) in accordance with the approved structure plan for the land. The WAPC approval is attached in Appendix A.

The subject land is bordered to the south and west by areas of newly-created Regional Open Space (ROS), formerly owned by Mr Piacentini and now owned freehold by the WAPC. Figure 1 shows the location and an aerial photograph of the ROS.

The ROS in Lots 6 and 317 has a total area of 98 hectares. It is reserved for Parks & Recreation under the GBRS and is expected to be vested in the DBCA to be managed for conservation in accordance with a management agreement under the *Conservation and Land Management Act 1984*. This agreement is subject to agreement over funding between the WAPC and DBCA, and no timeline for its implementation is known.

Condition 2 of the WAPC subdivision approval states:

"2. A Regional Open Space Rehabilitation and Management Plan (including wetland rehabilitation) is to be prepared and implemented to a width of 100m over the neighbouring Regional Open Space (Lot 6 and Lot 317) to the satisfaction of the Western Australian Planning Commission, in consultation with the Department of Biodiversity, Conservation and Attractions, Local Government and in accordance with EPA Advice A384782. (Department of Biodiversity, Conservation and Attractions)"

This ROS Management Plan has been prepared in consultation with the DBCA and the Shire of Capel to satisfy Condition 2.

2.0 EXISTING ENVIRONMENT

2.1 Regional Context

The ROS occupies Lots 6 and 317 Minninup Road. Lot 6 mostly comprises a wetland mapped by the Department of Biodiversity, Parks & Attractions (DBCA) as a Basin Sumpland and has a Unique Feature Identifier (UFI) of 15821. The wetland was previously mapped as Conservation category but, following a review in 2011 (BES, 2011), the DBCA (then DPAW) changed the management category to Resource Enhancement.

Lot 317 contains areas of upland parkland-cleared Tuart woodland in the east and west, with a section of cleared wetland in the centre.

Figure 1 shows an aerial photograph of the ROS and its location in relation to the development area.

2.2 Physiography

The wetland in Lot 6 occupies an interdunal swale between the Spearwood and Quindalup dune systems. To the east, the Spearwood system forms a large, gently sloping linear dune that extends for over 10km parallel to the coast. To the west, the Quindalup system forms a broad band of steep, irregular dunes that extends to the coast. Figure 2 shows topographic contours of the ROS.

The western boundary of the wetland is well defined by an abrupt change in slope at the base of the Quindalup dunes. The eastern boundary of the wetland is much less well defined due to the very gentle slopes on that side. The extent of inundation and saturation on the eastern side varies significantly with inter-seasonal and inter-annual changes in groundwater level.

The soils beneath the wetland are mapped by the Geological Survey of Western Australia (GSWA, 1981) as “Swamp Deposits (Qhw): Typically dark grey or brown, fine sands or silts with varied but significant amounts of peat.” The dunes to the west are mapped as part of the Quindalup Dunes system with soils of Safety Bay Sand (Qhs): Cream, calcareous quartz sand in which shell fragments make up 10% to 80% percent of the whole. The upland soils to the east are mapped as part of the Spearwood Dunes system, with soils of Tamala Limestone-derived sand (Qts): Medium to coarse quartz sand, typically off-white near the surface with a yellow to orange subsoil due to iron coating.

2.3 Hydrology

Groundwater exists beneath the subject land at depths ranging from 18m beneath the dunes in the east and west to less than zero (above ground) in the wetland. Figure 2 shows average annual maximum groundwater level (AAMGL) contours based on seven bores within the development area and a long-term DoW bore located 1.2km to the east on Bussell Highway.

The shallow groundwater flows generally in a westerly direction and discharges to the coastal swamps and the ocean. The average seasonal variation in the water table is less than one metre.

The wetland is seasonal, with extensive areas of saturation and smaller areas of open water occurring in winter. The extent of open water varies greatly between years depending on the groundwater level. Figure 2 shows the extent of inundation in a relatively dry winter (2010) compared with the estimated extent at the AAMGL. The wetland dries out completely by late summer.

Apart from the wetland, there is no naturally-occurring surface water in the ROS. Surface runoff would occur only over short distances under extreme rainfall conditions.

2.4 Vegetation

2.4.1 Vegetation Types

The vegetation and flora of the ROS and the development area have been surveyed on several occasions by McCutcheon (2001 and 2002), RPS Bowman Bishaw Gorham (2006) and Weston (2007, 2008 and 2009). Figure 3 shows the vegetation types.

The vegetation west of the wetland consists of a mosaic of Tuart (*Eucalyptus* gomphocephala) Open Forest to Woodland with a middle storey of Peppermint (*Agonis flexuosa*). Where Tuart is absent the vegetation is mapped as Peppermint Woodland. Except for a few small areas, the understorey comprises various mixtures of pasture grasses and other established alien grasses and herbaceous weeds. The most common or conspicuous native understorey species include the shrubs *Rhagodia baccata, Diplolaena dampieri, Myoporum caprarioides, Templetonia retusa, Leucopogon parviflorus* and *Spyridium globulosum*, the lianes *Hardenbergia comptoniana* and *Clematis linearifolia*, the herbs *Acanthocarpus preissii* and the *sedge Lepidosperma gladiatum*. Significant areas west of the wetland have been cleared and consist only of pasture grasses and weeds.

The wetland is mostly dominated by alien species, especially Asian Bulrush (*Typha orientalis*) and Clubrush (*Isolepis prolifera*). However, four native species are dominants of relatively small stands of native wetland and transitional vegetation. These include an *Acacia saligna – Agonis flexuosa* Closed Low Forest in the north-east corner of the

wetland and *Melaleuca rhaphiophylla* (Swamp Paperbark) Open to Closed Low Forests and *Baumea articulata* (Jointed Rush) Closed Tall Sedgelands in western parts of the wetland. Aliens are prominent in the understoreys of the Swamp Paperbark Forests, but there are few understorey plants, either native or alien, in the *Baumea articulata* Sedgelands.

The vegetation east of the wetland consists of an Open Forest of Tuart (*Eucalyptus gomphocephala)* with Peppermint (*Agonis flexuosa*), Jarrah (*Eucalyptus marginata)* and Marri (*Corymbia calophylla)* over a Woodland of *Banksia attenuata* and *Banksia grandis* over scattered native understorey species including *Hibbertia cuneiformis*, *Jacksonia furcellata*, *Macrozamia reidlei*, *Lepidosperma gladiatum* and *Pteridium esculentum* over pasture grasses and weeds including *Lagurus ovatus*, *Avena barbata*, *Bromus diandrus*, *Briza maxima* and *Lupinus cosentinii*.

No Declared Rare or Priority Flora or Threatened or Priority Ecological Communities are listed on DBCA or WA Herbarium databases as occurring in the ROS, and none were found during the vegetation surveys.

2.4.2 Vegetation Condition

The subject land has been used for grazing for a considerable period, with the result that the remaining vegetation consists largely of an understorey of pasture grasses, with or without an overstorey of mature trees. Figure 4 shows the vegetation condition.

West of the wetland, the vegetation condition is generally Degraded to Completely Degraded, and even Totally Cleared, largely due to replacement of native shrubs and herbaceous plants in the understorey by aliens. It ranges, on the six-point Keighery-Trudgen scale, from Completely Degraded (CD) to Good (G) and, in a few relatively small areas, Very Good to Excellent (VG-E). There are also areas totally cleared of native species (TC).

The surveys found that most (90%) of the wetland vegetation was Degraded or Completely Degraded, consisting of cleared paddocks dominated by pasture grasses and Asian Bulrush (*Typha orientalis*). Much of this area was until recently regularly slashed and/or ploughed by the property manager to maintain pasture growth and control Bulrushes.

Small pockets of wetland vegetation consisting of paperbark (*Melaleuca rhaphiophylla*) closed forest in Good, Very Good or Excellent condition remain in the western parts of the wetland along the margins of the Quindalup dunes.

Most of the herbaceous layer in the wetland also comprises alien species, and most of the wetland has no overstorey. The exceptions are the *Acacia saligna – Agonis flexuosa* Closed Low Forest in the north-east corner of the project area, and the *Melaleuca rhaphiophylla* Open to Closed Low Forests and *Baumea articulata* Closed Tall Sedgelands in western parts of the wetland.

The condition of the vegetation east of the wetland, with the possible exception of some small areas dominated by Tuart and Peppermint trees, is assessed as Completely Degraded. Disturbance to the vegetation structure has been caused by partial clearing, grazing, weed invasion, tree deaths and disease.

2.5 Fauna

Fauna surveys of the subject land have been carried out by Bamford (2012), Bamford & Wilcox (2001), Green Iguana (2006) and Harewood (2007 & 2012). These surveys were reported in the Environmental Summary Report (BES, 2015) prepared for the Scheme amendment. Additional observations of fauna and habitats have been undertaken during botanical and other site surveys.

2.5.1 Wetland

The western part of the wetland dominated by paperbark woodland and *Typha* beds provides seasonal nesting and feeding habitats for a range of waterbirds including ducks, grebes, herons and ibis. Migratory species are unlikely to use the wetland as it is dry in summer when most migratory species visit the region.

As well as waterbirds, the vegetation of the eastern side of the wetland (particularly the *Acacia-Agonis* thicket in the north-east corner) provides nesting and feeding habitat for bush birds and species that inhabit the fringes of wetlands.

The western part of the wetland is likely to provide habitat for aquatic species that can tolerate seasonal drying by burrowing to the water table, such as Koonacs and Gilgies. Long-necked Turtles are unlikely to be present because, although this species can aestivate when necessary by burying itself in the mud, it is unlikely to be able or willing to sustain this on an annual basis. Given the seasonal drying of the wetland, it is unlikely that any aquatic species requiring permanent surface water would survive there.

Sinclair & Hyder (2009) found evidence of quokkas in 2008 at Muddy Lake, about 2km south of UFI 15821. The evidence of quokkas was found in dense vegetation within and to the west of a wetland that had been protected from grazing for several years, where quokkas could find cover from foxes and other predators. It is possible that quokkas also persist in other parts of the wetland chain, including the western side of UFI 15821, although the heavier clearing and grazing in this area and particularly to the south makes this less likely (E. Sinclair, pers. comm.). The proposed rehabilitation works described in this document and in the Revegetation Management Plan (Report no. J07013i) should increase the suitability of the vegetation, particularly west of the wetland, for quokkas.

Dryland animals such as kangaroos use the cleared parts of the wetland for grazing.

2.5.2 Uplands

The Tuart-Peppermint woodland on the upland parts of the site provides roosting and potential breeding habitat for Carnaby's and Red-Tailed Black Cockatoos. Surveys by Bamford & Wilcox (2001) and Bamford Consulting Ecologists (2011) found a number of potential cockatoo nesting trees in the area east of the wetland but little food resource for the birds. No cockatoo feeding or breeding activity was observed on the site in either survey.

The site's vegetation provides suitable habitat for both the Western Ringtail Possum and the Common Brushtail Possum, and numerous hollows within the site's Tuart trees are suitable for use by both species. However, the lack of canopy connectivity and native understorey, particularly east of Maidment Parade, greatly reduces the habitat value of the vegetation for Ringtails.

Surveys by Green Iguana (2006), Bamford Consulting Ecologists (2011) and Harewood (2007 & 2012) have found direct and indirect evidence of low-level occupation of the site by Western Ringtail Possums (WRP), including dreys (nests – mostly derelict), scats and occasional live sightings. Figure 3 shows the locations of these sightings.

The critical habitat element for WRP survival is the presence of an interconnected Peppermint canopy, which provides the possums with both food and nest sites, and enables the possums to move between trees without the need to descend to ground level, where they are vulnerable to predation. Such interconnected canopies occur to a limited extent on the site west of the wetland, but rarely east of the wetland.

Revegetation described in this plan and the Revegetation Management Plan (Report no. J07013i) is expected to significantly enhance the value of the site for both black cockatoos and WRP.

2.6 Ecological Linkages

The importance of maintaining or creating ecological linkages between coastal and inland areas in the Greater Bunbury Region was recognised by the Department of Environment in its "*A Strategy for the EPA to identify regionally significant natural areas in its consideration of the Greater Bunbury Region Scheme Portion of the Swan Coastal Plain"* (2002). The potential to preserve an ecological linkage from Dalyellup via Gelorup to Crooked Brook was subsequently identified by the EPA in Appendix 4 to Bulletin 1108: *Ecological Linkages in the Greater Bunbury Region* (2003).

The EPA initially recommended, in Bulletin 1108, that all of Lots 315-317 and the western parts of Lots 313 and 314 should be preserved as part of the linkage. Following an appeal by the Shire of Capel, the Minister for the Environment determined that the linkage function in this area would be sufficiently served by reserving the

western parts of Lots 313 to 316 (now Lot 6) and all of Lot 317. The development area shown in the current subdivision approval reflects this decision.

Under the terms of his approval under the EPBC Act 2000 for clearing 39ha of Tuart woodland on Lots 2 - 5, Mr Piacentini has committed to planting approximately 11,200 Tuart, Peppermint, Banksia and other species over 28ha of Lot 317 to create feeding and breeding habitat for Western Ringtail Possums and black cockatoos. Figure 5 shows the preliminary planting area. The final layout of the planting area and the details of the planting programme are set out in the Revegetation Management Plan.

2.7 Fire

Due to its largely cleared status and private ownership, the subject land has not been subject to fire for at least several decades. The trunks of large trees show no signs of fire in recent times.

Prevention of fire will be an important part of ongoing management of the ROS. Rehabilitation in areas close to residences will be designed to achieve moderate fuel loadings, both to protect residences and to minimise the potential for fire to spread into the ROS. Bushfire protection is addressed in the Bushfire Management Plan (RUIC, 2018).

2.8 Aboriginal and European Heritage

There are no sites of Aboriginal or European heritage significance listed within the subject land.

2.9 Current and Previous Tenure and Use

From 1969 to 2016 Lots 6 and 317 were owned by Mr Piacentini and used for broadacre grazing. In 2016 the land was purchased by the State government as part of the agreement to permit rezoning of Lots 2 - 4 Minninup Rd to Urban under the Greater Bunbury Region Scheme. The purchased land is owned freehold by the WAPC and is expected to be vested in the DBCA to be managed for conservation. This vesting is subject to discussions over funding for management of regional parks in the Greater Bunbury region and its timing is unknown.

There is currently no authorised public use of the ROS land, although unauthorised access by four-wheel drive vehicles has been and continues to be an issue. This mainly takes the form of vehicles crossing the site to reach the coast, and to date has resulted in little damage to the site apart from fences and gates. This problem is expected to diminish or cease when development of the site brings increased public surveillance of the ROS.

3.0 IMPACTS OF DEVELOPMENT

3.1 Geology and Geomorphology

Development of the subject land will cause no direct change to the geology or geomorphology of most of the ROS.

Battering of the Maidment Parade road reserve will extend up to about 20m into the eastern side of the wetland buffer. This battering is necessary to match the levels of Maidment Parade to the roundabout at the northern end. The width of the batter will vary between about 12m and 20m, with the gradient varying from 1-in-10 to 1-in-6. Figure 6 shows a conceptual profile through the batter.

Prevention of erosion and sedimentation from the newly constructed batter will be a high priority during the construction programme.

3.2 Hydrology

Clearing for urban development typically causes a short-term rise in groundwater levels due to the reduction in evapotranspiration. The effect normally diminishes in the first few years following development as trees, gardens and bores become established in the urban area. With the considerable depths to groundwater over much of the development area, the prevalence of domestic bores may be less than usual, with the result that there may be a slight long-term rise in groundwater levels. If this occurs, it may produce a benefit for the wetland by counteracting the long-term drying trend in the wetland.

Following development, the wetland will receive occasional surface inflows from bioretention swales in the development area. This will not alter the overall water flows into the wetland, since these overflows would have otherwise entered the wetland as groundwater flow. The impact on the hydrology of the wetland will be minimal.

Urban development has the potential to increase the quantities of nutrients, sediments and other contaminants, originating from fertilisers and road runoff, entering the wetland. The contaminant of primary concern in freshwater ecosystems is phosphorus.

Minimisation of contaminant entry to the wetland will be a high priority of the drainage and subdivision design. This is discussed in detail in the Urban Water Management Plan (Report no. J07013e).

3.3 Vegetation and Flora

The development of the subject land will not entail any clearing or disturbance of native vegetation in the ROS but will bring considerable benefits in the form of weed removal and revegetation. Details of the rehabilitation programme are given in Section 4.1 and Appendix B.

3.4 Fauna

The development will have benefits for fauna habitat in the ROS through the permanent cessation of cattle grazing and the revegetation of approximately 40ha of wetland and upland. Details of the rehabilitation programme are given in Section 4.1 and Appendix B. In particular, the rehabilitation is expected to benefit Western Ringtail Possums and black cockatoos through the establishment of habitat trees. It also has potential to benefit Quokkas and other small mammals through an increase in dense understorey vegetation.

The development will bring threats to the ROS including a possible increased presence of cats and dogs. Feral cats are already undoubtedly present in the ROS, and cannot be kept out or eradicated by any means currently available in urban areas. The best means of limiting cat impacts on the ROS will be by educating residents to keep their inside at night and/or to fit them with bells.

Dogs will generally be under the control of their owners. Dogs and their owners will be prevented or at least discouraged from entering the ROS from the development area by a 1.2m high fence.

3.5 Disease

The development is not expected to bring any increased risk of disease to the ROS.

3.6 Fire

The increased human presence and the increased density of vegetation in the ROS will cause an increased fire hazard to the ROS. This will be counterbalanced by the increased level of surveillance created by houses fronting the ROS, which will reduce the opportunities for deliberate fire lighting.

Fire hydrants located at 100m intervals along the roads fronting the ROS will provide water for fire fighting in the ROS if necessary. Access for emergency vehicles into the ROS will be provided by gates as shown on Figure 5.

3.7 Aboriginal and European Heritage

There are no known Aboriginal or European heritage values associated with the ROS and therefore there will be no impacts in this regard from the development.

3.8 Community Use and Amenity

The wetland in Lot 6 is intended to be an important landscape element and backdrop for the western part of the development area. Lot 317 will be primarily managed for the purpose of conservation and public use will not be encouraged. Public paths along the interface between the development area and the ROS will provide views into and over the ROS.

With increased human presence will come the potential for antisocial behaviour such as littering, drinking, arson, illegal vehicle access and vandalism. All of these will be inhibited by the high level of visual surveillance provided by houses adjacent to the ROS.

4.0 ROS MANAGEMENT COMMITMENTS

4.1 Revegetation

Extensive revegetation will be carried out across upland and wetland areas of the ROS. This will include 28ha of habitat creation in Lot 317 (as described in the Revegetation Management Plan, Report no. J07013i) and 12.7ha of rehabilitation in the wetland and buffer (described in the Wetland Management Plan, Report no. J07013f).

These revegetation works are summarised below.

4.1.1 Habitat Corridor

Planting will be undertaken to create a continuous habitat corridor from the western to the eastern end of Lot 317. The area to be planted is shown on Figure 5.

Rehabilitation will begin in advance of urban development with trials to test different methods of ground preparation, weed control, planting and seedling protection. Details of the trials are summarised in Appendix B.

The primary purposes of the planting are to:

- create a continuous, interconnected tree canopy (mostly of peppermints but including banksias, paperbarks, jarrah and marri) across Lot 317 to provide habitat for Western Ringtail Possums; and
- create feeding, roosting and potential nesting habitat for black cockatoos.

In much of the upland area, a partial upper storey of Tuarts already exists. In these areas, Tuarts and other overstorey species will be planted at varying spacings as required to achieve an overall overstorey density of 25/ha.

Similarly, in areas where a mid-storey and/or understorey already exists, planting will be carried out at sufficient density to raise the overall density to 400/ha in each of the mid-storey and understorey.

On the advice of the DBCA (K. Williams, pers. comm.), in order to maximise the habitat value for possums and to minimise the time required for the habitat values to develop, Peppermint will be planted at a higher density of 400/ha (5m spacing) in a mosaic of 1ha patches across the upland area, focussing on the TPW (Tuart-Peppermint woodland) and TP (Tuart-Peppermint Open Woodland) areas as shown on Figure 5. Within these patches, the Peppermints and Banksias will give a combined mid-storey density of 600/ha (4m spacing). About eight of these denser patches will be created across the planting area. Each patch will be of sufficient size to form a viable ringtail possum habitat, with animals able to move through the lower-density areas between the patches. Figure 5 shows the nominal locations of the high density patches.

The general form of the planting in the habitat corridor will be as follows:

- Planted area 28ha.
- Planted with overstorey & understorey trees, shrubs, sedges & herbs.

Trees

- Planting density 400/ha (5m spacing) – mostly tube stock.
- Additional peppermints to give combined 600/ha in eight high-density patches.
- Species (depending on location):

Agonis flexuosa	*Eucalyptus gomphocephala*
Banksia attenuata	*E. marginata*
B. menziesii	*E. rudis*
B. grandis	*Melaleuca rhaphiophylla*
B. littoralis	*M. preissiana*
Corymbia calophylla	

Shrubs

- Planting density 400/ha (5m spacing) – mostly direct seeded.
- Selected from the following native species:

Allocasuarina fraseriana	*Jacksonia sternbergiana*
Acacia alata	*Kunzea glabrescens*
A. cochlearis	*Macrozamia riedlei*
A. lasiocarpa	*Melaleuca incana*
A. pulchella	*M. thymoides*
A. rostellifera	*Olearia axillaris*
A. saligna	*Pericalymma ellipticum*
Beaufortia squarrosa	*Persoonia longifolia*
Hibbertia hypericoides	*Phyllanthus calycinus*
H. racemosa	*Rhagodia baccata*
Hovea trisperma	*Spyridium globulosum*
Hypocalymma angustifolium	*Templetonia retusa*
Jacksonia furcellata	*Xanthorrhoea preissii*

Sedges & Herbs

- Planting density 10,000/ha in patches (2,500/ha overall) – mostly direct seeded.
- Selected from the following native species:

Acanthocarpus preissii	*Gahnia trifida*
Baumea articulata	*Hypolaena exsulca*
B. juncea	*Juncus kraussii*
Burchardia congesta	*J. pallidus*
Cassytha flava	*Lepidosperma gladiatum*
Conostylis aculeata	*L. longitudinale*
Cyathochaeta avenacea	*Lyginia imberbis*
Dasypogon bromeliifolius	*Patersonia occidentalis*
Ficinia nodosa	*Phlebocarya ciliata*

The planting density will designed to allow for 20% attrition over the first few years of growth, leading to an ultimate density of about 320 mid-storey trees per hectare (480/ha in high-density patches) at a spacing of about 4.5-5.6m.

4.1.2 Wetland Rehabilitation

Rehabilitation in the wetland will focus on the wetland buffer and the eastern parts of the wetland that are most affected by clearing and weeds. Figure 5 shows the areas of the wetland and buffer to be rehabilitated.

Rehabilitation will begin in advance of urban development with trials to test different methods of ground preparation, weed control, planting and seedling protection. Details of the trials are summarised in Appendix B.

The general form of the rehabilitation in the wetland and buffer will be as follows:

Wetland

- Planted area approx. 8.83ha.
- Planted with trees, shrubs, sedges and herbs.

Trees

- Planting density 50/ha (15m spacing) – tube stock.
- Selected from the following native species:

Agonis flexuosa	*Melaleuca preissiana*
Banksia littoralis	*M. rhaphiophylla*
Eucalyptus rudis	

Shrubs

- Planting density 400/ha (5m spacing) – mostly direct seeded.
- Selected from the following native species:

Acacia lasiocarpa	*Melaleuca thymoides*
Beaufortia squarrosa	*Phyllanthus calycinus*
Hypocalymma angustifolium	*Xanthorrhoea preissii*
Astartea fascicularis	*M. teretifolia*
A. saligna	*Pericalymma ellipticum*
Kunzea glabrescens	*Regelia ciliata*
Melaleuca incana	*Viminaria juncea*

Sedges & Herbs

- Planting density 10,000/ha in patches (2,500/ha overall) – mostly direct seeded.
- Selected from the following native species:

Baumea articulata	*Lyginia imberbis*
B. juncea	*Cassytha flava*
Ficinia nodosa	*Cyathochaeta avenacea*
Gahnia trifida	*Dasypogon bromeliifolius*

Juncus kraussii	*Hypolaena exsulca*
Juncus pallidus	*Patersonia occidentalis*
Lepidosperma longitudinale	*Phlebocarya ciliata*

Wetland Buffer

- Planted area approx. 3.84ha.
- Planted with sedges, herbs, low shrubs (<2m) and scattered trees (<10% cover).

Trees
- Planting density 50/ha (15m spacing) – tube stock.
- Species: *Melaleuca preissiana, M. rhaphiophylla, Agonis flexuosa.*

Shrubs (<2m)
- Planting density 400/ha (5m spacing) – mostly direct seeded.
- Selected from the following native species:

Acacia lasiocarpa	*Melaleuca thymoides*
Beaufortia squarrosa	*Phyllanthus calycinus*
Hypocalymma angustifolium	*Xanthorrhoea preissii*

Sedges & Herbs
- Planting density 10,000/ha in patches (2,500/ha overall) – mostly direct seeded.
- Species selection as for wetland.

4.2 Fauna

Revegetation in the ROS will be undertaken as described in the Revegetation Management Plan and Appendix B. A key aim of the revegetation will be the creation and enhancement of habitat for native fauna.

Entry of dogs to the ROS will be discouraged by signs directed at owners and by a 1.2m fence extending the length of the ROS interface with the development. The signs will include a contact number asking people to report sightings of dogs in the ROS.

4.3 Ecological linkages

Planting of peppermint, banksias and other overstorey and understorey species across a 28ha corridor through Lot 317 and the wetland will be undertaken as detailed in the Revegetation Management Plan and Appendix B. The intention of the planting is to create a continuous vegetation canopy between Regional Open Space areas to the west and east of the subject land, in order to create habitat for Western Ringtail Possums and black cockatoos.

Revegetation of the eastern part of the wetland and the wetland buffer will further enhance ecological linkages within the subject land.

4.4 Fire

Revegetation works in the wetland buffer will be designed to limit fuel loads while achieving full coverage of a representative range of wetland species. The plantings in this zone will feature shrubs less than 2m tall, trees at 15m or greater spacing, sedges and herbs. The planting will have a "shrubland" classification in fire hazard terms.

Fire fighting capability for the ROS and nearby residences will be provided by fire hydrants positioned at 100m intervals along Maidment Parade and the road adjacent to the southern ROS. Access to the ROS for fire and emergency vehicles will be provided by gates.

4.5 Community Use, Access and Amenity

The development area will abut the ROS along Maidment Parade and the southern perimeter road. The total length of the interface is about 1,450 metres excluding a 350m section in the middle of Maidment Parade, where the road reserve is separated from the ROS by parkland POS.

The interface along Maidment Parade will abut the wetland buffer, which will be densely planted with low shrubs, sedges and scattered trees as described in Section 4.1.2. The southern road interface will abut a 50m wide band of parkland-cleared Tuart-Jarrah woodland backed by the 250m wide habitat corridor, which will be densely planted with Peppermint, Banksias, Jarrah, Marri and understorey species, as described in Section 4.1.1.

The ROS interface along Maidment Parade and the southern road will be marked by a fence on the edge of the road reserve. The fence will nominally be constructed of black PVC-coated chain mesh on black steel posts with a steel top rail, similar to the example depicted below.

The purpose of the fence will be to delineate the edge of the ROS and to discourage entry by humans and dogs. The fence will not create a complete barrier to entry but will discourage casual entry and convey the message that public access to the ROS is not encouraged. This message will be reinforced by signs at intervals asking people not to enter the ROS. A concrete shared path will be located on the road verge.

On Maidment Parade, an overflow swale will be located between the path and the fence to further discourage access to the ROS. Gates will be placed at intervals on Maidment Parade to provide emergency vehicle access to the wetland. Gates will also be placed on the southern road to provide emergency and management access to the ROS and the habitat corridor. Figure 5 shows the general layout of the fences, paths and gates.

Park bench seats and rubbish bins will be located at intervals along the shared paths.

5.0 IMPLEMENTATION AND REVIEW

5.1 Implementation Schedule

Planting in Lot 317 and the wetland will begin before the start of subdivision, with the commencement of planting trials in a series of 2.5ha to 4ha plots in Lot 317 and the wetland buffer. Figure 5 shows the location and extent of these trials, which are described in detail in Appendix B. The trials will begin in the autumn immediately following the start of clearing (Year 1), with the commencement of 12-month weed control in the wetland and buffer. The trial plantings will be undertaken in April - June of the following year.

The trial plots will be monitored for twelve months after planting to give data on the success of the trialled techniques. The most successful and practical methods will be used for the major planting works to be completed in the year following the trial plantings (Year 3).

Other works in and near the ROS, including fences, paths and swales, will be constructed as part of subdivision works in the adjacent area.

5.2 Responsibility for Implementation

Mr Piacentini will undertake and fund the rehabilitation and protection works described in this management plan (including initial weed control, planting, fencing and earthworks) as part of the subdivision works on the subject land. Mr Piacentini will also undertake and fund the maintenance and monitoring activities described here for five years after the completion of the establishment and rehabilitation works.

At the end of the maintenance period, Mr Piacentini will hand over responsibility for the ROS management, excepting the habitat corridor plantings, to the relevant vesting agency. The identity of this agency has not yet been determined, but may be the DBCA, the WAPC or the Shire of Capel.

Under the terms of the Commonwealth EPBC approval, the habitat plantings in Lot 317 must be managed and maintained for twenty years. Because the status of funding for DBCA management of regional open space in the Greater Bunbury region is still unresolved, it is unclear whether the DBCA will be able or willing to take over management of the habitat corridor plantings after five years. As a result, Mr Piacentini has committed to managing the habitat plantings for twenty years or until a suitable arrangement has been negotiated for DBCA to take over the management.

5.3 Monitoring

5.3.1 Vegetation

The plantings in the habitat corridor will be monitored as follows, as set out in the Revegetation Management Plan:

- The condition of tree guards and fences will be monitored quarterly for the first three years after planting. Any guards that become displaced or damaged will be repositioned or replaced. Fences will be monitored for integrity and security on the same schedule and repaired as necessary.

- The success of the plantings will be monitored annually for five years after the completion of the planting programme. For the first two years this will be undertaken by the planting contractor; thereafter it may be done by the planting contractor or by a botanist contracted by Mr Piacentini.

- Monitoring of regrowth will be undertaken by a combination of high-resolution aerial photography and fixed 100m^2 quadrats selected and set out during the planting works. Approximately twenty quadrats will be established to cover the four major planting areas (upland, upland high-density, wetland and dunes). The distribution of quadrats between the planting zones will be based on area and planting density, as follows:
  - Upland West (Dunes) 7.84 ha 5 quadrats
  - Wetland 3.73 ha 3 quadrats
  - Upland East 8.44 ha 4 quadrats
  - Upland High Density 8 ha 8 quadrats (1 per patch)

  Figure 5 shows the distribution of the quadrats

- The identity, height, width and condition of all plants within each quadrat will be recorded to give data on species composition, cover, structure and health. Photographs will be taken at fixed points in each quadrat. Comparison between monitoring dates will provide data on survival rates. Opportunistic observations of fauna (especially black cockatoo and Western Ringtail Possum) presence in the revegetation area will be recorded.

- High-resolution aerial photography (sourced either from Landgate, other commercial supplier or drone) will be used each year to measure total canopy cover across the planting area. The canopy cover will be measured as a percentage cover of all native species. The aerial imagery will be provided to DEE each year as part of the annual report. The percentage cover of existing native vegetation will be measured before planting to provide a baseline against which post-planting growth can be compared.

- After five years have passed and the completion criteria have been met to the satisfaction of DEE, the transect monitoring will cease but monitoring of canopy cover by aerial imagery will continue.

- As well as the annual quantitative monitoring, qualitative visual monitoring (consisting of foot traverses of the quadrats and photography) will be undertaken quarterly for five years. The objectives of the qualitative monitoring will be to detect damage to tree guards and fences, detect disease (including dieback and Agonis canker) and assess weed growth.

- The results of each round of monitoring will be reported to the DBCA and the Shire of Capel and published on Mr Piacentini's website.

Plantings in the wetland and buffer will be monitored in a similar manner for five years after the completion of planting.

5.3.2 Community Use and Amenity

The developer will visually monitor public use of the ROS and surrounding paths. The monitoring will also include litter, traffic into the ROS, condition of the fences and paths. The monitoring will occur in conjunction with routine maintenance activities in and around the ROS.

5.3.3 Fauna

Monitoring of vegetation regrowth and habitat development will be undertaken for five years after the completion of planting as set out in Appendix B.

Visual monitoring of nuisance insect (mosquito and midge) numbers at the interface between the development area and the wetland will be undertaken by the developer for five years after the completion of subdivision works. A register of public complaints about nuisance insects will also be maintained. The results of both of these will be used to assess the need for insect control measures.

5.4 Success Criteria

Success of the ROS management will be indicated by:

- Establishment of self-sustaining vegetation in the habitat corridor with a density of at least 16 overstorey trees, 320 mid-storey trees (480 in high-density patches) and 320 understorey species per hectare in good health after five years, as set out in the Revegetation Management Plan (Report no. J07013i).

- An increase in the assessed habitat value of vegetation in the habitat corridor for black cockatoos (from a start quality of 5) and Western Ringtail Possums (from a start quality of 2) according to the scale employed in the DEE Offset Guide.

- Establishment of self-sustaining vegetation in good health in the wetland and buffer after five years.

- No significant damage to the ROS by foot traffic.

- No illegal vehicle (including motorcycle) traffic in the ROS.

- No significant occurrence of dogs or cats in the ROS.

- A low level of litter in the ROS.

5.5 Contingencies

Vegetation Establishment
If, at any time within the five-year maintenance period, monitoring shows that the survival rate of any planted structural element (overstorey, mid-storey or lower storey) or any area is approaching or below 80%, infill planting of the same structural element will be undertaken. If a particular species appears to be suffering high mortality then an alternative local species with similar habitat value may be used for the infill planting for the remainder of the maintenance period.

Public Use and Amenity
If excessive public access to or traffic in the ROS is seen to be occurring and causing damage to the vegetation, contingency actions may include:

- increased signage at access points;
- provision of alternative routes to satisfy pedestrian “desire lines” while avoiding key areas of the ROS; and
- increased signage and public education.

If illegal vehicular entry to the ROS occurs (most likely only in early stages when houses are not fully established fronting the ROS), extra protection measures may be taken such as installation of bollards, earth bunds or reinforced fencing.

6.0 REFERENCES

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Figures

Development Area
(internal layout as per Subdivisional Plan approved 8/2/2018)

Regional Open Space (GBRS)

Management Plan Boundary

Figure 1

SITE PLAN

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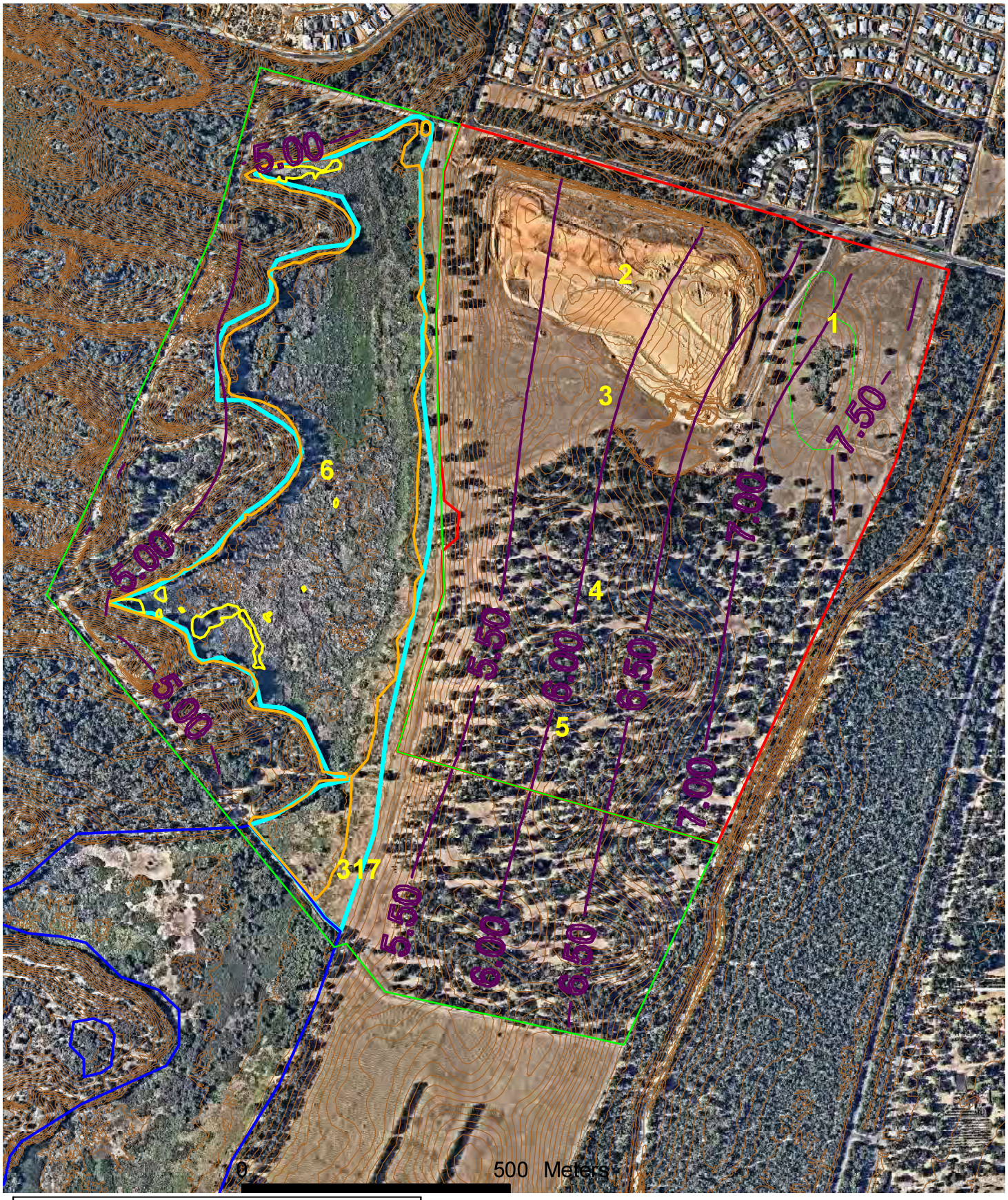
Aerial photo: Nearmap December 2019



- Development Area
- Management Plan Boundary
- Topographic Contour (mAHD)
- Average Annual Maximum Groundwater Level (AAMGL)
- Inundation at 26/10/2010
- Inundation at AAMGL (estimated)

Wetlands (DBCA)

- Conservation
- Resource Enhancement
- Multiple Use

Aerial photo: Nearmap December 2019

Figure 2

PHYSIOGRAPHY

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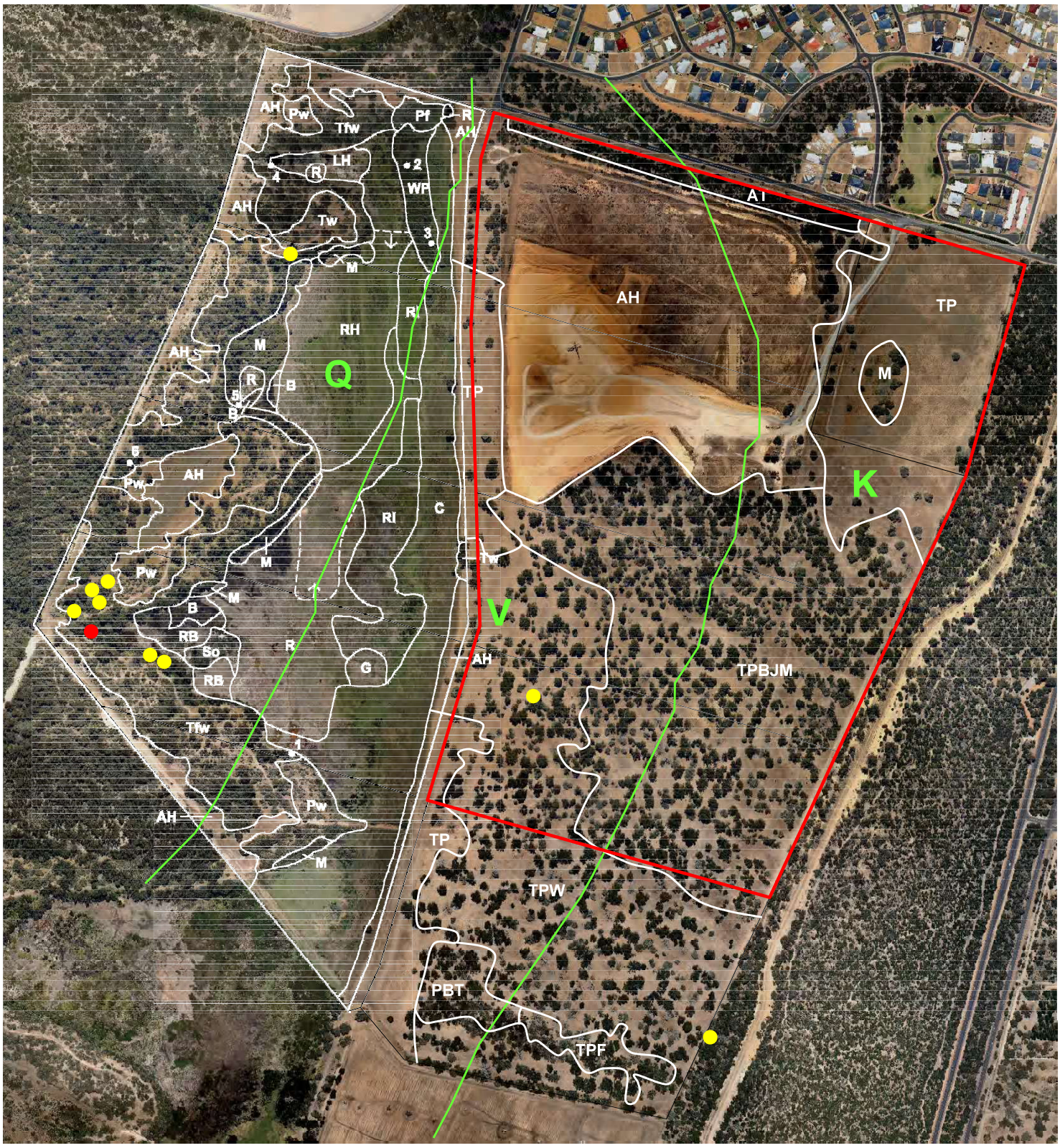

Upland Units

TPBJM	Tuart - Peppermint – Banksia – Jarrah – Marri Woodland
TPJ	Tuart – Peppermint – Jarrah Woodland
PBT	Peppermint – Banksia – Tuart Woodland
TPF	Tuart – Peppermint Open Forest
TPW	Tuart – Peppermint Woodland
TP	Tuart – Peppermint Open Woodland to Scattered Trees
AT	Tuart Woodland over Acacia Scrub
M	Paperbark Open Woodland
AH	Aliens – mixed grasses and other herbaceous plants
Pf	Peppermint Open to Closed Low Forest
Pw	Peppermint Woodland
Tfw	Tuart Open Forest to Woodland
Tw	Tuart Woodland
WP	*Acacia saligna* – Peppermint Closed Low Forest

Wetland Units

B	*Baumea articulata* Closed Tall Sedgeland
C	*Cirsium vulgare* – *Centella asiatica* Closed mixed, mostly alien Herbland
G	*Lepidosperma gladiatum* Open Sedgeland
So	Sumpland; open water in winter-spring; herbland in summer
M	*Melaleuca rhaphiophylla* Open to Closed Low Forest
R	*Typha orientalis* Tall Rushland; mainly Closed
RB	*Typha orientalis* Tall Rushland &/over mixed low herbs
RI	*Typha orientalis* Tall Rushland &/over *Isolepis prolifera* Clubrush

● **1** Relevés 1 to 6

Vegetation Complexes
(Heddle *et al.*, 1978)

Q	Quindalup
V	Vasse
K	Karrakatta – Central and South

Western Ringtail Possum

- Drey
- Live animal sighted

Figure 3

VEGETATION AND FAUNA

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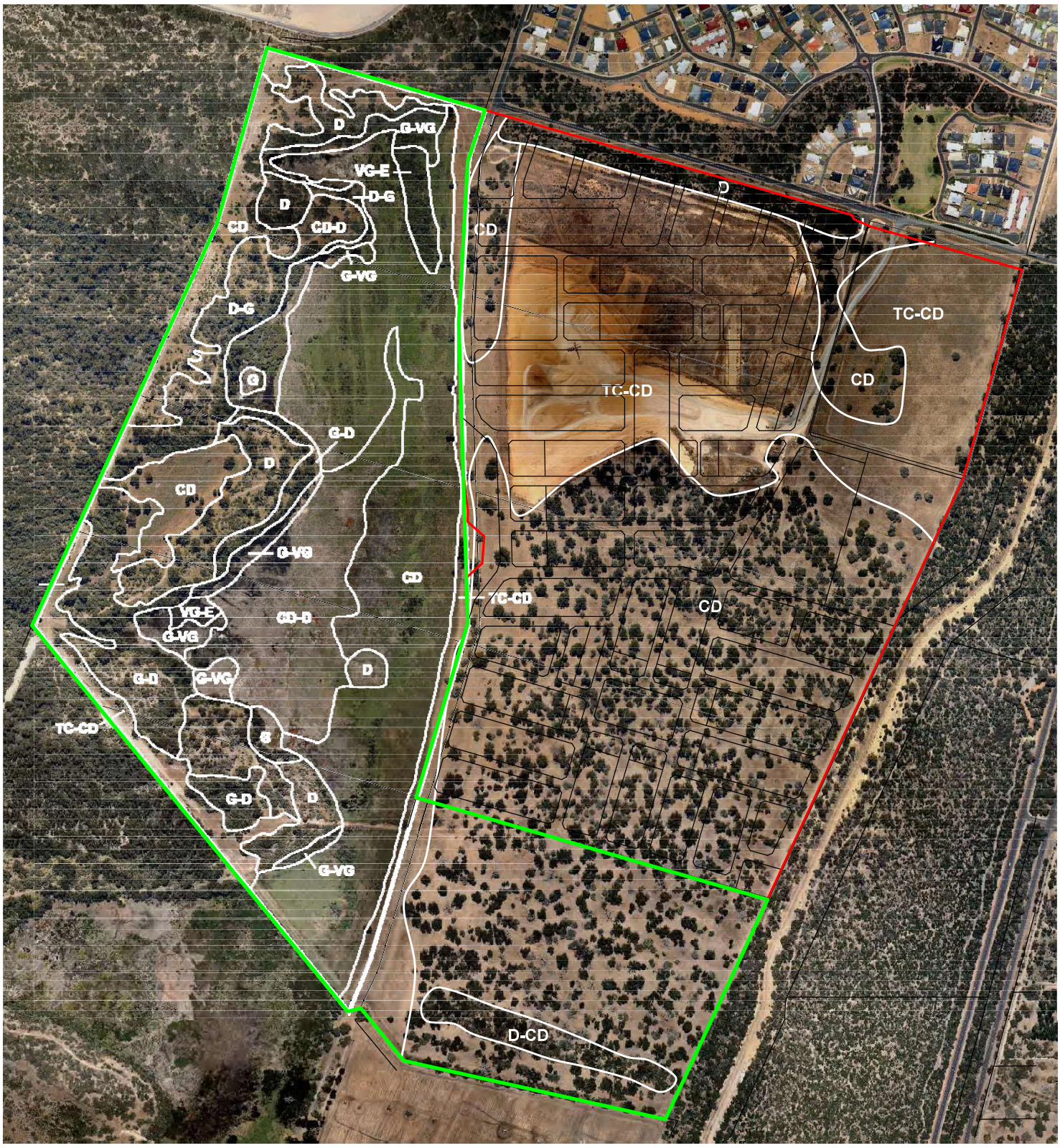

Development Area

Management Plan Boundary

Condition Ratings

E	Excellent
VG	Very Good
G	Good
D	Degraded
CD	Completely Degraded
TC	Totally cleared of native vegetation

Figure 4

VEGETATION CONDITION

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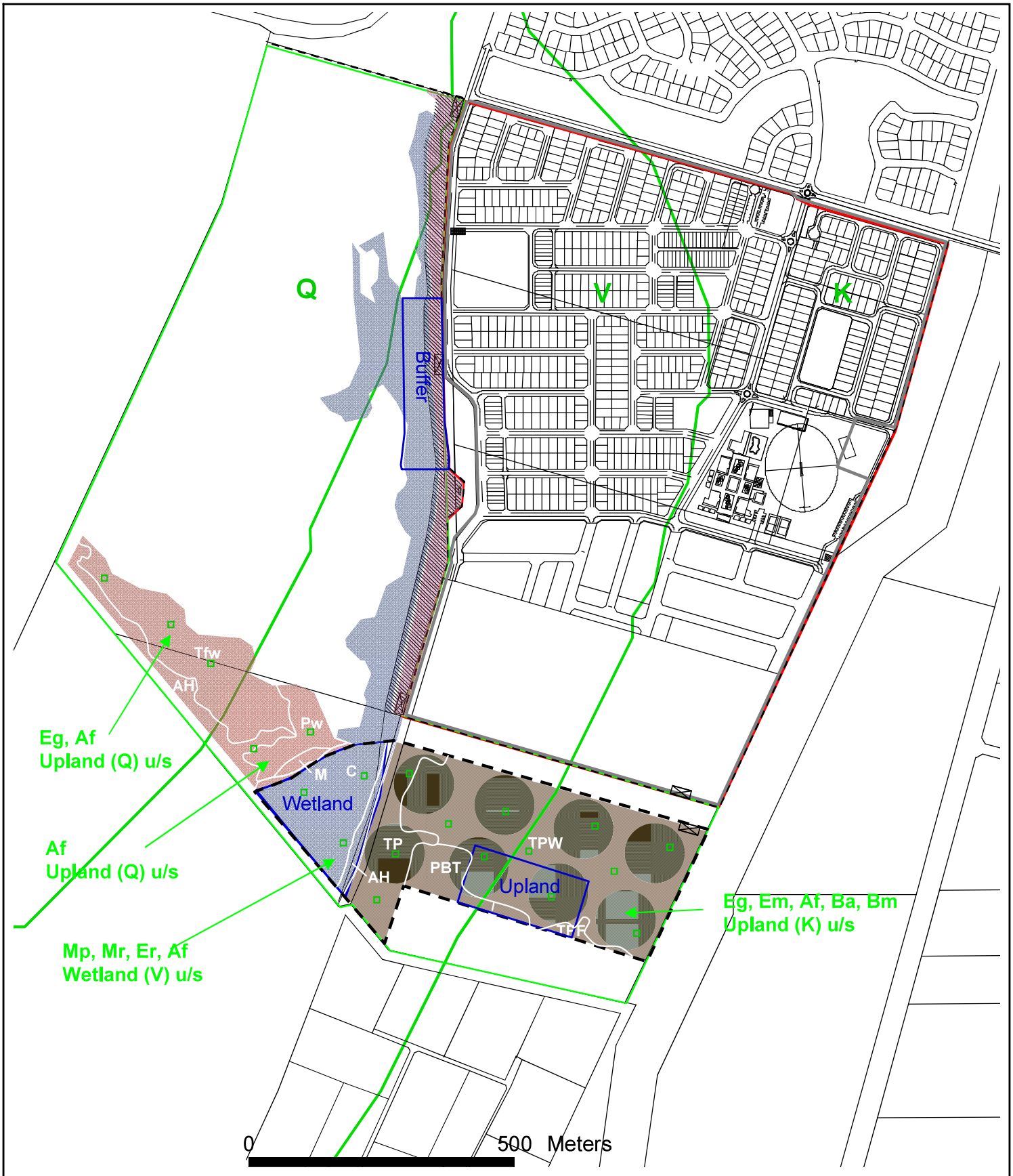

Fences
- 1.2m chain mesh (permanent)
- 1.8m chain mesh (temporary)
- Shared Path
- Gate (emergency/management vehicles)
- Af — Planting species

Planting Zones
- Upland West (Dunes)
- Wetland
- Wetland buffer
- Upland East
- Upland High Density
- Monitoring Quadrats
- Trial plots

Figure 5

MANAGEMENT MEASURES

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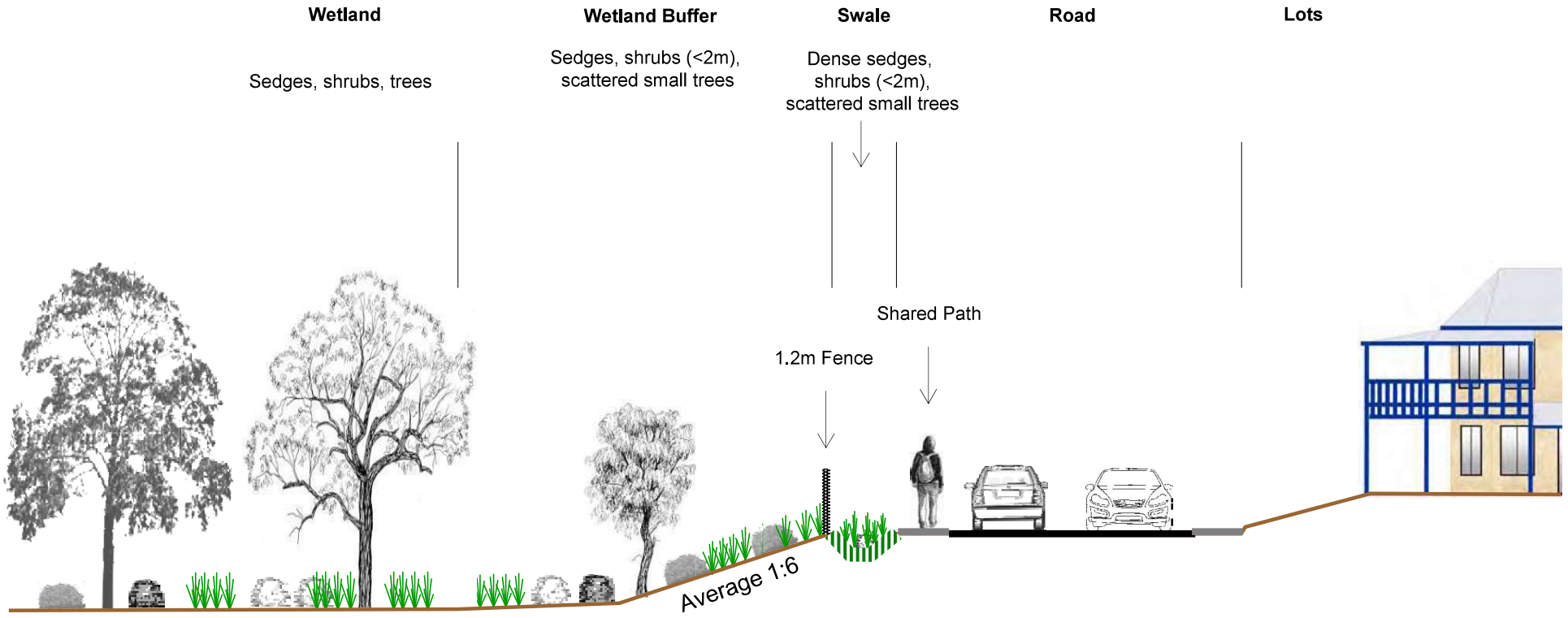

Not to scale

Figure 6

WETLAND BUFFER AND BATTER CONCEPTUAL PROFILE

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Appendix A

WAPC Subdivision Approval

Western Australian Planning Commission

Your Ref :

Lb Planning
191 Naturaliste Terrace

DUNSBOROUGH WA 6281

Approval Subject To Condition(s)
Freehold (Green Title) Subdivision

Application No : 155519

Planning and Development Act 2005

Applicant	:	Lb Planning 191 Naturaliste Terrace DUNSBOROUGH WA 6281
Owner	:	Colin Michael Piacentini Po Box 308 BUNBURY WA 6231
Application Receipt	:	2 August 2017

Lot Number	:	2,3 & 4
Diagram / Plan	:	P407125
Location	:	
C/T Volume/Folio	:	2901/250, 2901/251, 2901/252
Street Address	:	Lot 2 Maidment Parade, Dalyellup
Local Government	:	Shire of Capel

The Western Australian Planning Commission has considered the application referred to and is prepared to endorse a deposited plan in accordance with the plan date-stamped **02 August 2017** once the condition(s) set out have been fulfilled.

This decision is valid for **four years** from the date of this advice, which includes the lodgement of the deposited plan within this period.

The deposited plan for this approval and all required written advice confirming that the requirement(s) outlined in the condition(s) have been fulfilled must be submitted by **08 February 2022** or this approval no longer will remain valid.

Reconsideration - 28 days

Under section 151(1) of the *Planning and Development Act 2005*, the applicant/owner may, within 28 days from the date of this decision, make a written request to the WAPC to reconsider any condition(s) imposed in its decision. One of the matters to which the WAPC will have regard in reconsideration of its decision is whether there is compelling evidence by way of additional

information or justification from the applicant/owner to warrant a reconsideration of the decision. A request for reconsideration is to be submitted to the WAPC on a Form 3A with appropriate fees. An application for reconsideration may be submitted to the WAPC prior to submission of an application for review. Form 3A and a schedule of fees are available on the WAPC website: http://www.planning.wa.gov.au

Right to apply for a review - 28 days

Should the applicant/owner be aggrieved by this decision, there is a right to apply for a review under Part 14 section 251 of the *Planning and Development Act 2005*. The application for review must be submitted in accordance with part 2 of the *State Administrative Tribunal Rules 2004* and should be lodged within 28 days of the date of this decision to: the State Administrative Tribunal, Level 6, State Administrative Tribunal Building, 565 Hay Street, PERTH, WA 6000. It is recommended that you contact the tribunal for further details: telephone 9219 3111 or go to its website: http://www.sat.justice.wa.gov.au

Deposited plan

The deposited plan is to be submitted to the Western Australian Land Information Authority (Landgate) for certification. Once certified, Landgate will forward it to the WAPC. In addition, the applicant/owner is responsible for submission of a Form 1C with appropriate fees to the WAPC requesting endorsement of the deposited plan. A copy of the deposited plan with confirmation of submission to Landgate is to be submitted with all required written advice confirming compliance with any condition(s) from the nominated agency/authority or local government. Form 1C and a schedule of fees are available on the WAPC website: http://www.planning.wa.gov.au

Condition(s)

The WAPC is prepared to endorse a deposited plan in accordance with the plan submitted once the condition(s) set out have been fulfilled.

The condition(s) of this approval are to be fulfilled to the satisfaction of the WAPC.

The condition(s) must be fulfilled before submission of a copy of the deposited plan for endorsement.

The agency/authority or local government noted in brackets at the end of the condition(s) identify the body responsible for providing written advice confirming that the WAPC's requirement(s) outlined in the condition(s) have been fulfilled. The written advice of the agency/authority or local government is to be obtained by the applicant/owner. When the written advice of each identified agency/authority or local government has been obtained, it should be submitted to the WAPC with a Form 1C and appropriate fees and a copy of the deposited plan.

If there is no agency/authority or local government noted in brackets at the end of the condition(s), a written request for confirmation that the requirement(s) outlined in the condition(s) have been fulfilled should be submitted to the WAPC, prior to lodgement of the deposited plan for endorsement.

Prior to the commencement of any subdivision works or the implementation of any condition(s) in any other way, the applicant/owner is to liaise with the nominated agency/authority or local government on the requirement(s) it considers necessary to fulfil the condition(s).

The applicant/owner is to make reasonable enquiry to the nominated agency/authority or local government to obtain confirmation that the requirement(s) of the condition(s) have been fulfilled. This may include the provision of supplementary information. In the event that the nominated agency/authority or local government will not provide its written confirmation following reasonable enquiry, the applicant/owner then may approach the WAPC for confirmation that the condition(s) have been fulfilled.

In approaching the WAPC, the applicant/owner is to provide all necessary information, including proof of reasonable enquiry to the nominated agency/authority or local government.

The condition(s) of this approval, with accompanying advice, are:

CONDITION(S):

1. All boundaries of the subdivision area and the western boundary of Maidment Parade adjoining Regional Open Space, bushlands and wetlands are to be fenced (including provision of a gate at an agreed location) by the proponent to the standards of the Department of Biodiversity, Conservation and Attractions to control access by people, vehicles and pets. (Department of Biodiversity, Conservation and Attractions)

2. A Regional Open Space Rehabilitation and Management Plan (including wetland rehabilitation) is to be prepared and implemented to a width of 100m over the neighbouring Regional Open Space (Lot 6 and Lot 317) to the satisfaction of the Western Australian Planning Commission, in consultation with the Department of Biodiversity, Conservation and Attractions, Local Government and in accordance with EPA Advice A384782. (Department of Biodiversity, Conservation and Attractions)

3. A Wetland Rehabilitation and Management Plan is to be prepared and implemented to the satisfaction of the Western Australian Planning Commission. (Department of Biodiversity, Conservation and Attractions)

4. A Western Ringtail Possum Management Plan is to be prepared and implemented to the satisfaction of the Western Australian Planning Commission. (Department of Biodiversity, Conservation and Attractions)

5. A Black Cockatoo Management Plan is to be prepared and implemented to the satisfaction of the Western Australian Planning Commission. (Department of Biodiversity, Conservation and Attractions)

6. A Kangaroo Impact Management Plan is to be prepared and implemented to the satisfaction of the Western Australian Planning Commission. (Department of Biodiversity, Conservation and Attractions)

7. Measures being taken to ensure the identification and protection of any vegetation on the site worthy of retention that is not impacted by subdivisional works, prior to commencement of subdivisional works. (Local Government).

8. Information is to be provided to demonstrate that the measures contained in the bushfire management plan have been implemented during subdivisional works. (Local Government)

9. A Notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificate(s) of title of the proposed lot(s) with a Bushfire Attack Level (BAL) rating of 12.5 or above, advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan).

   The notification is to state as follows:

   'This land is within a bushfire prone area as designated by an Order made by the Fire and Emergency Services Commissioner and may be subject to a Bushfire Management Plan. Additional planning and building requirements may apply to development on this land' (Western Australian Planning Commission)

10. A notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificates of title of the proposed lot(s) advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:

    'This lot is in close proximity to known mosquito breeding areas. The predominant mosquito species is known to carry viruses and other diseases.' (Western Australian Planning Commission)

11. A notification, pursuant to Section 165 of the *Planning and Development Act 2005* is to be placed on the certificate(s) of title of the proposed lot(s) advising of the existence of a hazard or other factor. Notice of this notification is to be included on the diagram or plan of survey (deposited plan). The notification is to state as follows:

    'This lot is located in close proximity to a sand and limestone extraction site and may be adversely affected by virtue of noise and dust emissions from that facility.' (Western Australian Planning Commission)

12. The land denoted as proposed primary school site on the approved plan of subdivision is to be set aside as a separate lot, pending the acquisition of the land by the Department of Education. (Department of Education)

13. Arrangements being made to the satisfaction of the Western Australian Planning Commission and to the specification of Western Power for the provision of an underground electricity supply to the lot(s) shown on the approved plan of subdivision. (Western Power).

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14. The transfer of land as a Crown reserve free of cost to Western Power for the provision of electricity supply infrastructure. (Western Power)

15. Prior to the commencement of subdivisional works, an urban water management plan is to be prepared and approved, in consultation with the Department of Water and Environmental Regulation, consistent with the 'PT Lots 313-316 Maidment Parade and Lot 1 Harewoods Road - Dalyellup Local Water Management Strategy (Report No. J07013c, 29 April 2015'. (Local Government)

16. Engineering drawings and specifications are to be submitted and approved, and works undertaken in accordance with the approved engineering drawings and specifications and approved plan of subdivision, for the filling and/or draining of the land, including ensuring that stormwater is contained on-site, or appropriately treated and connected to the local drainage system. Engineering drawings and specifications are to be in accordance with an approved Urban Water Management Plan (UWMP) for the site, or where no UWMP exists, to the satisfaction of the Western Australian Planning Commission. (Local Government)

17. Engineering drawings and specifications are to be submitted, approved, and works undertaken in accordance with the approved engineering drawings, specifications and approved plan of subdivision, for grading and/or stabilisation of the site to ensure that:

a) lots can accommodate their intended use; and

b) finished ground levels at the boundaries of the lot(s) the subject of this approval match or otherwise coordinate with the existing and/or proposed finished ground levels of the land abutting. (Local Government)

18. The applicant making arrangements to ensure that management of mosquito breeding is incorporated into the design and ongoing maintenance of wetlands and urban drainage systems within the subdivision area to the satisfaction of the local government. (Local Government).

19. Prior to the commencement of subdivisional works, the landowner/applicant is to provide a pre-works geotechnical report certifying that the land is physically capable of development or advising how the land is to be remediated and compacted to ensure it is capable of development; and
In the event that remediation works are required, the landowner/applicant is to provide a post geotechnical report certifying that all subdivisional works have been carried out in accordance with the pre-works geotechnical report. (Local Government).

20. Drainage easements and reserves as may be required by the local government for drainage infrastructure being shown on the diagram or plan of survey (deposited plan) as such, granted free of cost, and vested in that local government under Sections 152 and 167 of the Planning and Development Act 2005. (Local Government)

21. Arrangements being made to the satisfaction of the Western Australian Planning Commission for the filling and/or capping of any bores and/or wells, or the identification of any bore and/or well to be retained on the land. (Local Government)

22. Arrangements being made with the Water Corporation or Aqwest so that provision of a suitable water supply service will be available to the lots shown on the approved plan of subdivision. (Water Corporation or Aqwest)

23. Arrangements being made with the Water Corporation so that provision of a sewerage service will be available to the lots shown on the approved plan of subdivision. (Water Corporation)

24. The proposed reserve(s) shown on the approved plan of subdivision being shown on the diagram or plan of survey (deposited plan) as reserve(s) for Drainage and Recreation and/or Community Purposes and vested in the Crown under Section 152 of the *Planning and Development Act 2005*, such land to be ceded free of cost and without any payment of compensation by the Crown. (Local Government)

25. The proposed Community Purpose reserves being connected to reticulated power, water and sewerage service. (Local Government)

26. Arrangements being made for the proposed public open space to be developed by the landowner/applicant to a minimum standard and maintained for two summers through the implementation of an approved landscape plan providing for the development and maintenance of the proposed public open space in accordance with the requirements of Liveable Neighbourhoods and to the specifications of the local government. (Local Government)

27. Arrangements being made with the Shire of Capel to the satisfaction of the Western Australian Planning Commission, for the landowner/applicant to contribute towards the costs of providing community and/or common infrastructure as established through Amendment No.65 (when gazetted) to the Shire of Capel Town Planning Scheme No.7. (Local Government)

28. The landowner/applicant entering into a Deed of Agreement with Main Roads regarding the timing, funding and upgrading of the Bussell Highway / Harewoods Road intersection, prior to the first stage of subdivision clearance, to the satisfaction of the WAPC. The terms of the Deed of Agreement is to generally reflect the "Dalyellup South - Strategy for Implementation of the Strategic Road Network - Rev 3", dated 14 December 2017 (as amended). (Main Roads WA)

29. Engineering drawings and specifications are to be submitted, approved, and subdivisional works undertaken in accordance with the approved plan of subdivision, engineering drawings and specifications, to ensure that those lots not fronting an existing road are provided with frontage to a constructed road(s) connected by a constructed road(s) to the local road system and such road(s) are constructed and drained at the landowner/applicant's cost.

As an alternative, and subject to the agreement of the Local Government the Western Australian Planning Commission (WAPC) is prepared to accept the landowner/applicant paying to the local government the cost of such road works as estimated by the local government and the local government providing formal assurance to the WAPC confirming that the works will be completed within a reasonable period as agreed by the WAPC. (Local Government)

30. Engineering drawings and specifications are to be submitted and approved, and subdivisional works undertaken in accordance with the approved plan of subdivision, engineering drawings and specifications to ensure that:

a) street lighting is installed on all new subdivisional roads to the standards of the relevant licensed service provider; and

b) roads that have been designed to connect with existing or proposed roads abutting the subject land are coordinated so the road reserve location and width connect seamlessly; and

c) temporary turning areas are provided to those subdivisional roads that are subject to future extension; and

d) embayment parking is provided abutting Public Open Space and the proposed medium density lots affected by access restrictions imposed by condition 37;

to the satisfaction of the Western Australian Planning Commission. (Local Government)

31. Engineering drawings and specifications are to be submitted, approved, and subdivisional works undertaken in accordance with the approved plan of subdivision, engineering drawings and specifications, for the provision of shared paths through and connecting to the application area in accordance with the Dalyellup South - Strategy for the Implementation of the Strategic Road Network. The approved shared paths are to be constructed by the landowner/applicant. (Local Government)

32. Arrangements being made for the preparation and implementation of the Dalyellup South - Strategy for the Implementation of the Strategic Road Network to the satisfaction of the local government, in consultation with Main Roads WA. (Local Government)

33. Harewoods Road being widened to 22 metres where it abuts the application area in accordance with the approved plan of subdivision by the landowner transferring the land required to the Crown free of cost for the purpose of widening. (Local Government)

34. The section of Harewoods Road widened in accordance with this approval, is to be constructed and drained at the full cost of the landowner/applicant. (Local Government)

35. All local streets within the subdivision being truncated in accordance with the Western Australian Planning Commission's *Liveable Neighbourhoods* policy.(Local Government)

36. Pursuant to Section 150 of the *Planning and Development Act 2005* and Division 3 of the *Planning and Development Regulations 2009* a covenant preventing vehicular access onto Harewoods Roads being lodged on the certificate(s) of title of proposed lots 1, 18, 34, 35, 93, 94, 124, 583 at the full expense of the landowner/applicant. The covenant is to prevent access, to the benefit of the Shire of Capel, in accordance with the plan dated 2 August 2017 (attached) and the covenant is to specify:

    "*No vehicular access is permitted to and from (as applicable) Harewoods Road*" (Local Government)

37. Pursuant to Section 150 of the *Planning and Development Act 2005* and Division 3 of the *Planning and Development Regulations 2009* a covenant preventing vehicular access onto the primary street frontage being lodged on the certificate(s) of title of proposed lots 130-146, 171-207, 230-237, 262-269, 275, 367-374, 380, 499-505, 526-532 and 553-559 (inclusive) at the full expense of the landowner/applicant. The covenant is to prevent access, to the benefit of the Shire of Capel, in accordance with the plan dated 2 August 2017 (attached) and the covenant is to specify:

    "*No vehicular* access *is permitted to and from (as applicable) the primary street frontage*." (Local Government)

38. Local Development Plan(s) being prepared and approved for lots 8-11, 19-22, 26-29, 57-60, 73-76, 83-86, 100-103, 110-113, 117-120, 130-138, 139-146, 157-160, 171-211, 218-237, 248-251, 262-279, 291-294, 306-327, 328-331, 337-381, 394-397, 409-412, 421-425, 433-435, 449-452, 481-484, 499-505, 514-517, 526-532, 541-544, 553-559 and 568-571 that addresses the following:

a) Vehicular access points;

b) Driveways, garages and setbacks; and

c) Uniform fencing.

to the satisfaction of the Western Australian Planning Commission. (Local Government)

39. Uniform fencing being constructed along the boundaries of all of the proposed lots abutting public open space. (Local Government)

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40. Uniform fencing being constructed along the primary street frontage of lots 130-146, 171-207, 230-237, 262-268, 367-380, 499-505, 526-532 and 553-559. (Local Government)

41. The landowner/applicant shall make arrangements to ensure that prospective purchasers are advised in writing that:

a) lots the subject of a Local Development Plan that Local Development Plan provisions apply;

b) the Shire of Capel will impose a specified area rate within the Precinct for the purposes of assisting with the maintenance of public open space and infrastructure in the locality; and

c) portions of public open space will be subject to occasional inundation as part of the functioning of the local stormwater drainage system and action that should be taken to minimise the release of nutrients to the local environment from their premises.(Local Government)

42. The street block containing Lots 306-326 (inclusive) being redesigned such that proposed Lots 306, 307, 325 and 326 achieve a minimum lot size of 260m² per lot. (Western Australian Planning Commission)

ADVICE:

i. In regard to Condition 6, the management plan is to cover the application area and Lot 317 to the south.

ii. In regard to Condition 11, the landowner/applicant is advised that if evidence is provided that the sand and limestone extraction have ceased operating after conditional approval is granted then Condition 11 will no longer need to be satisfied.

iii. In regard to Condition 13, Western Power provides only one underground point of electricity supply per freehold lot.

iii. Condition 16 has been imposed in accordance with Better Urban Water Management Guidelines (WAPC 2008). Further guidance on the contents of urban water management plans is provided in 'Urban Water Management Plans: Guidelines for preparing and complying with subdivision conditions' (Published by the then Department of Water 2008).

iv. In regard to Condition 24, separate reserves are to be created for the Community Purpose sites, in consultation with the Shire of Capel.

v. With regard to Condition 24, the development is to include full earthworks, basic reticulation, grassing of key areas, and pathways that form part of the overall pedestrian and/or cycle network.

vi. With regard to Condition 26, the development is to include full earthworks, basic reticulation, grassing of key areas, and pathways that form part of the overall pedestrian and/or cycle network.

vii. Condition 27 is in acknowledgement of proposed Amendment No.65 that is viewed by the Western Australian Planning Commission to be a seriously entertained planning proposal, which will provide for developer contributions for community infrastructure.

viii. In regard to Condition 34, the applicant may come to agreement with other landowners for shared contributions to the upgrade, at their agreement.

ix. The landowner/applicant and the local government are advised to refer to the Institute of Public Works Engineering Australia Local Government Guidelines for Subdivisional Development (current edition). The guidelines set out the minimum best practice requirements recommended for subdivision construction and granting clearance of engineering conditions imposed.

Kerrine Blenkinsop
Secretary
Western Australian Planning Commission
8 February 2018

Enquiries : Scott Penfold (Ph 9791 0588)

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LOT YIELD TABLE					
LOT YIELD			LOT AREA		
Size	No. Lots	% Total Lots	Average Size	% of Total Area	Area
180m² - 234m²	43	7.43%	225m²	4.17%	9675m²
235m² - 319m²	89	15.37%	268m²	10.30%	23870m²
320m² - 449m²	172	29.71%	373m²	27.71%	64232m²
450m² - 499m²	207	35.75%	472m²	42.17%	97758m²
500m² - 549m²	54	9.33%	520m²	12.13%	28114m²
550m² - 599m²	11	1.90%	571m²	2.71%	6287m²
600m² - 699m²	3	0.52%	624m²	0.81%	1872m²
Total Number of Lots	579				
SCHOOL SITE	1				3.51ha
LOCAL CENTRE	1				5131m²
BALANCE LOT	1				12.04ha

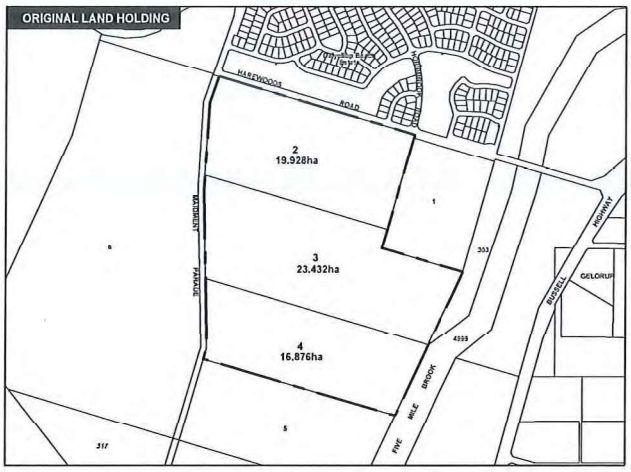
Residential Lots: Minimum Lot Size 225m² Average Lot Size 400m²
Maximum Lot Size 654m² Total Lot Area 231816m²

POS TABLE	
POS A	1.53ha
POS B	3384m²
POS C	6002m²
POS D	1.54ha
POS E	3.85ha
POS TOTAL	8.30ha

DEPARTMENT OF PLANNING, LANDS AND HERITAGE

DATE 02-Aug-2017 FILE 155519

ORIGINAL LAND HOLDING



A	16/3/2017	FIRST ISSUE
Revision	Date	Item

NOTES
Base data supplied by Landgate / MNG
Areas and dimensions shown are subject to final survey calculations.
All contaminants are shown for illustrative purposes only and are subject to detailed engineering design.
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LEGEND
- APPLICATION BOUNDARY
- PROPOSED BOUNDARY
- EXISTING BOUNDARY TO BE REMOVED
- EXISTING VEGETATION

PHOENIX RISE DEVELOPMENTS PTY LTD
CLIENT : DEVELOPMENTS PTY LTD
SCALE : 1:2,000@A1
DATE : 26 July 2017
PLAN No : DS-3-002.dgn
REVISION : B
PLANNER : SLB
DRAWN : BL

PROPOSED PLAN OF SUBDIVISION
Lots 2, 3 & 4 Maldment Parade, DALYELLUP

LB PLANNING
TOWN PLANNING | URBAN DESIGN | LAND DEVELOPMENT CONSULTING

Appendix B

Planting Plan

1.0 PLANTING PLAN

1.1 Implementation

The planting will be undertaken by a professional rehabilitation specialist engaged by Piacentini Developments Pty Ltd. The rehabilitation contractor will be accredited with the Revegetation Industry Association of Western Australia or equivalent.

The planting will begin with a series of trials to test different weed control and ground preparation techniques (herbicides, scalping, burning, hoeing), planting methods (tube stock vs direct seeding) and seedling protection measures (e.g fencing vs tree guards, fence height etc.). Details of the trials are given in Section 1.8.

1.2 Site Preparation

The focus of site preparation will be to remove weeds and ground compaction from the planting site so as to give the seedlings the best possible chance of survival.

1.2.1 Weed Control

Herbicide Treatment

- A knockdown herbicide (usually glyphosate-based) will be used to kill all weeds in the planting area.
- Less weed-infested areas may require only a single treatment one month before planting.
- Heavily weed-infested sites (especially with grasses) may require repeated treatments over twelve months.
- In and close to the wetland, a herbicide approved for aquatic use such as Roundup Biactive® will be required. Residual herbicides will not be used in or near the wetland.
- Herbicide may be applied broadacre (e.g. by boom spray) or by spot-application (targeting individual planting sites). Broadacre application is likely to be used in the east of the site and in the wetland, while spot application may be used for infill plantings in the west.

Scalping

- In areas with very heavy grass growth, machinery may be used after herbicide treatment to remove the top 20cm or so of soil, thereby removing much of the weed seed store and surviving rhizomes.
- This has the advantage of delaying weed re-emergence.
- The main disadvantage is loss of the most fertile part of the soil profile.
- The effectiveness of scalping will depend on the depth of rhizomes and roots.

Burning

- After herbicide treatment, fire may be used (depending on the density of grass growth and the results of trials) to remove the dead plant material and kill surviving parts of plants and seeds.
- This may delay the re-emergence of weeds.
- Burning also creates an ash bed into which seeds or seedlings can be planted.
- Woody debris from the clearing in the development area may also be burned in the revegetation areas to create an ash bed for seedlings.
- The effectiveness of burning depends on the intensity of the fire. Sufficient heat to kill seeds and rhizomes typically penetrates only a few centimetres into the soil, while grass rhizomes may penetrate to 0.5m and roots to over 3m.

1.2.2 Ground Preparation

Ripping

Ripping to a depth of 0.5m helps to break up ground compaction (caused by vehicles and/or cattle) and aids root penetration. Shallower ripping to 0.2-0.3m may be used in areas where existing tree roots need to be protected. Ripping will not be employed within the "drip line" of existing trees.

Mounding

Mounding with a disc plough or similar may be used to create mounds into which tube stock are planted.

Mulching

Mulched debris from the clearing may be applied to a depth of about 5cm and ploughed into the topsoil to help maintain soil aeration, increase organic content and reduce moisture loss.

1.3 Species Selection and Source

Tuart, Jarrah, Banksias, Peppermint and paperbarks will be the primary tree species used in the planting, with a particular emphasis on Peppermint (the main food source for possums) and Banksias (the main food source for black cockatoos). Understorey species will also be planted to maximise the sustainability and habitat value of the vegetation. These will be a mixture of species drawn from the local species listed in Table 2.1.

Most planting will be carried out using nursery tube stock sourced from local nurseries, grown from seed collected on or within 5km of the planting site. The exact understorey species grown will depend upon the species in fruit at the time of the seed collection.

Depending on the results of trials, some understorey species may be direct-seeded.

1.4 Planting Density

Tube stock planting density will vary depending on the location, as detailed below.

Wetland

- Planted area approx. 8.83ha.
- Planted with trees, shrubs, sedges and herbs.
- Density:

Trees	50/ha (15m spacing)
Shrubs	400/ha (5m spacing)
Sedges & herbs	10,000/ha in patches (overall 2,500/ha).

Wetland Buffer

- Planted area approx. 3.84ha.
- Planted with sedges, herbs, low shrubs (<2m) and scattered trees (<10% cover).
- Density:

Trees	50/ha (15m spacing)
Shrubs	400/ha (5m spacing)
Sedges & herbs	10,000/ha in patches (overall 2,500/ha).

Swales

- Planted area approx. 1.85ha.
- Planted with sedges, herbs, low shrubs (<2m) and scattered trees (<10% cover).
- Density:

Trees	50/ha (15m spacing)
Shrubs	400/ha (5m spacing)
Sedges & herbs	10,000/ha (1m spacing).

Possum/Cockatoo Habitat

- Planted area 28ha.
- Planted with overstorey & understorey trees, shrubs, sedges & herbs.
- Density:

Trees	400/ha (5m spacing)
Shrubs	400/ha (5m spacing)
Sedges & herbs	400/ha (5m spacing).

If direct seeding is employed, the seed will be applied at a rate of approximately 4 kg/ha, depending upon the particular species being seeded. The seed will be prepared by scarifying, soaking and/or smoking before planting, as appropriate to the species.

In areas where a mid-storey and/or understorey already exists, planting will be carried out at sufficient density to raise the overall density to 400/ha in each of the mid-storey and understorey.

The planting density is designed to allow for 20% attrition over the first few years of growth.

1.5 Timing of Planting

Tube stock planting will be undertaken nominally in June after the first significant winter rains. The timing may be varied depending on the arrival of significant rainfall.

Direct seeding will be undertaken approximately one to two months earlier than tube stock planting, before the start of winter rains.

1.6 Planting Method

Tube Stock
A hand planter ("Pottiputki" or similar) will be used to drill a hole approximately 175mm deep and 55mm wide for each seedling. Each seedling will be planted with a slow-release native plant fertiliser pill.

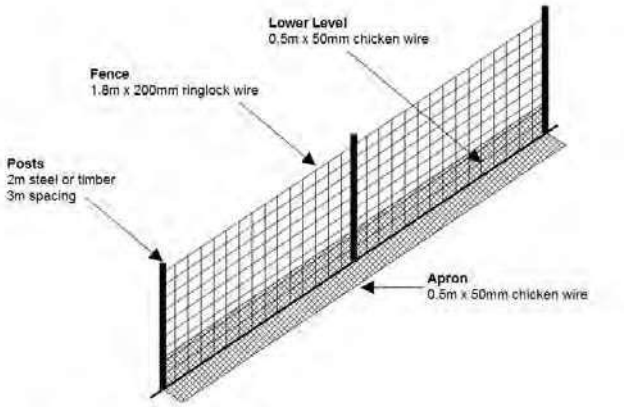
Direct Seeding
Direct seeding has the ability to create high-density seedling growth of certain species at significantly less effort and cost than tube stock planting. Because the seedlings germinate *in-situ*, direct seeding also tends to produce more robust plants and a more diverse, naturally-structured vegetation form (M. Blunt, Tranen, pers. comm.).

Mr Piacentini's company is well equipped and experienced in direct seeding through its extensive rehabilitation work for mining companies. If direct seeding is used, it will be carried out with equipment designed for native seed, with the seeding depth and configuration set for the particular species being seeded.

1.7 Protection of Seedlings

The seedlings will be protected from grazing by kangaroos and rabbits by fencing or tree guards. Fencing is likely to be used in the larger planting areas, while tree guards may be used in smaller infill planting areas.

The fences will constructed of 1.8m high ringlock wire on posts with a 0.5m chicken wire lower layer and a 0.5m apron to prevent kangaroos and rabbits from digging or pushing under the fence. The diagram below shows an example of the type of fencing proposed.



Indicative Fence Design

The fencing and/or tree guards will be kept in place and maintained for at least two years, after which the new growth is expected to be large enough to withstand grazing. After two years, the tree guards will be inspected and progressively removed once the plants reach a height of 1m for trees and 0.5m for shrubs (based on advice from Tranen Revegetation Systems Pty Ltd). The fences will be left in place for five years. After this time, provided the completion criteria have been met, they will be either removed or left in place, depending on the wishes of the WAPC and the DBCA.

1.8 Pre-Planting Trials

In order to optimise the site preparation, planting and protection techniques for the site, a series of trials will be carried out before the full-scale planting begins. The trials will be conducted in three 2.5ha-3.75ha plots on upland, wetland and wetland buffer locations and will test:

- Site preparation
  - Duration of pre-planting weed control (1 month vs 12 months)
  - Burning
  - Scalping (wetland and buffer only)
  - Ripping
- Planting method
  - Tube stock vs direct seeding (understorey species)
- Protection
  - Fencing vs tree guards
  - Mulching

The trials will begin in autumn immediately following the start of clearing (Year 1), with the commencement of 12-month weed control in the wetland and buffer. The plantings will be undertaken in April - June of the following year. Each set of plots will include a control plot, which will be planted with no pre-planting weed control, ground preparation or protection (fencing or tree guards). The plots (except the control plot) will be surrounded by a 10m weed-free buffer to minimise weed encroachment from untreated areas.

The trial plots will be monitored for twelve months after planting and the success of the different strategies (including seedling survival, growth rates and need for follow-up weed control) assessed. The most successful and practical methods will be used for the major planting works to be completed in the year following the trial plantings (Year 3).

Figure 1 shows the locations of the trial plots.

2.0 POST-PLANTING MAINTENANCE

2.1 Weed Control

Follow-up weed treatments using an appropriate herbicide applied by hand sprayer or wand will be undertaken in spring in the year of planting and the year following. For the subsequent three years (i.e. 3-5 years after planting), annual quantitative weed monitoring will be carried out in spring and visual weed inspections will be carried out quarterly. Weed control will be undertaken as and where necessary, based on the results of the quarterly inspections and annual monitoring. This may include additional weed control treatments in other seasons.

The necessity for weed control will be assessed not on fixed criteria but on the judgement of the contractor as to whether the height and density of weeds is likely to impede the growth of the planted vegetation. The point at which weed control becomes necessary will vary with the area and the stage of growth of the plantings.

2.2 Monitoring

2.2.1 Objectives of Monitoring

The primary objective of post-planting monitoring is to confirm that the planted vegetation is thriving and creating viable habitat. These habitat values are expected to develop gradually over a period of up to twenty years. Within the five-year intensive management period, the development of habitat values will be visible as an increase in vegetation cover, particularly in the critical Peppermint, Flooded Gum and Banksias.

Within this overall framework, specific objectives of the monitoring include demonstrating that:

- the new plantings are achieving, or progressing towards achieving, the completion criteria of species richness, vegetation cover and health;
- the regrowth is not being significantly impaired by grazing, weed growth, drought or vandalism;
- fences and other protective measures are in good repair and functioning effectively;
- fires, disease and other catastrophic events are avoided.

2.2.2 Monitoring Programme

Hardware and Structures
The condition of tree guards and fences will be monitored quarterly for the first three years after planting. Any guards that become displaced or damaged will be repositioned or replaced. Fences will be monitored for integrity and security on the same schedule and repaired as necessary.

Vegetation
The success of the plantings will be monitored annually for five years after the completion of the planting programme. For the first two years this will be undertaken by the planting contractor; thereafter it may be done by the planting contractor or by a botanist contracted by Piacentini Developments Pty Ltd.

Quantitative monitoring of regrowth will be undertaken by a combination of high-resolution aerial photography and fixed 100m^2 quadrats selected and set out during the planting works. Approximately four quadrats will be established within the 8.8ha planting area within the wetland.

The identity, height, width and condition of all plants within each quadrat will be recorded to give data on species composition, cover, structure and health. Photographs will be taken at fixed points in each quadrat. Comparison between monitoring dates will provide data on survival rates. Opportunistic observations of fauna (especially black cockatoo and Western Ringtail Possum) presence in the revegetation area will be recorded.

After five years have passed, the transect monitoring will cease but monitoring by aerial imagery will continue. As well as the annual quantitative monitoring, qualitative visual monitoring (consisting of foot traverses of the quadrats and photography) will be undertaken quarterly. The objectives of the qualitative monitoring will be to detect damage to tree guards and fences, detect disease (including dieback and Agonis canker) and assess weed growth.

Fauna
Observations of black cockatoo and Western Ringtail Possum presence in the revegetation area will be recorded during the annual and quarterly monitoring visits. Indications of presence will include:

- Black cockatoos – birds seen or heard feeding, roosting or overflying the area, chewed nuts or banksia cones, dropped leaves and twigs beneath trees.
- Western Ringtail Possum – direct sightings, dreys, signs of browsing on Peppermints, droppings beneath trees.

At the end of the five-year intensive management period, at the request of DBCA a detailed fauna survey will be carried out by a fauna specialist to assess the habitat value

of the revegetation area for Western Ringtail Possums and black cockatoos and to search for the presence of each species within the site.

Reporting
The results of each round of monitoring will be reported to the DEE and published on Mr Piacentini's website.

2.3 Completion and Success Criteria

The planting density is designed to allow for 20% attrition of seedlings. Success of the planting will therefore be defined as a density of at least 80% of the planted density in good health after five years. Further indications of success will be:

- an increase in the assessed habitat value of the vegetation for black cockatoos and Western Ringtail Possums; and
- observed direct or indirect evidence of black cockatoo or Western Ringtail Possum presence in the revegetation area.

2.4 Contingency Response

If, at any time within five years after planting, monitoring shows that the survival rate of any planted structural element (overstorey, mid-storey or lower storey) or any area is approaching or below 80%, infill planting of the same structural element will be undertaken. If a particular species appears to be suffering high mortality then an alternative local species with similar habitat value may be used for the infill planting for the remainder of the five-year maintenance period.

If aerial imagery monitoring shows that the total canopy cover after twenty years is less than 80%, infill planting of appropriate canopy species (Peppermint in upland, Paperbark in wetland) will be undertaken. In practice, aerial imagery monitoring in previous years will provide an indication of whether the 80% target is likely to be achieved, thus allowing pre-emptive infill planting to be undertaken if necessary.

2.5 Reporting

Mr Piacentini will report regularly on the progress of the pre-planting trials, the planting programme and post-planting monitoring. The reports will be forwarded to the relevant agencies and published on Mr Piacentini's website. A preliminary reporting schedule is shown below.

Item	*Expected timing of report*
Start of trials	May following start of clearing (Year 1)
Completion of trial plantings	July Year 2

Results of trials	June Year 3
Start of major site preparation	June Year 3
Completion of full-scale plantings	July Year 3 – Year 4
Annual monitoring results	December Year 3 – Year 8
Adverse events (eg fire, vandalism)	With annual compliance report
Report success after 5 years	December Year 7 – Year 8

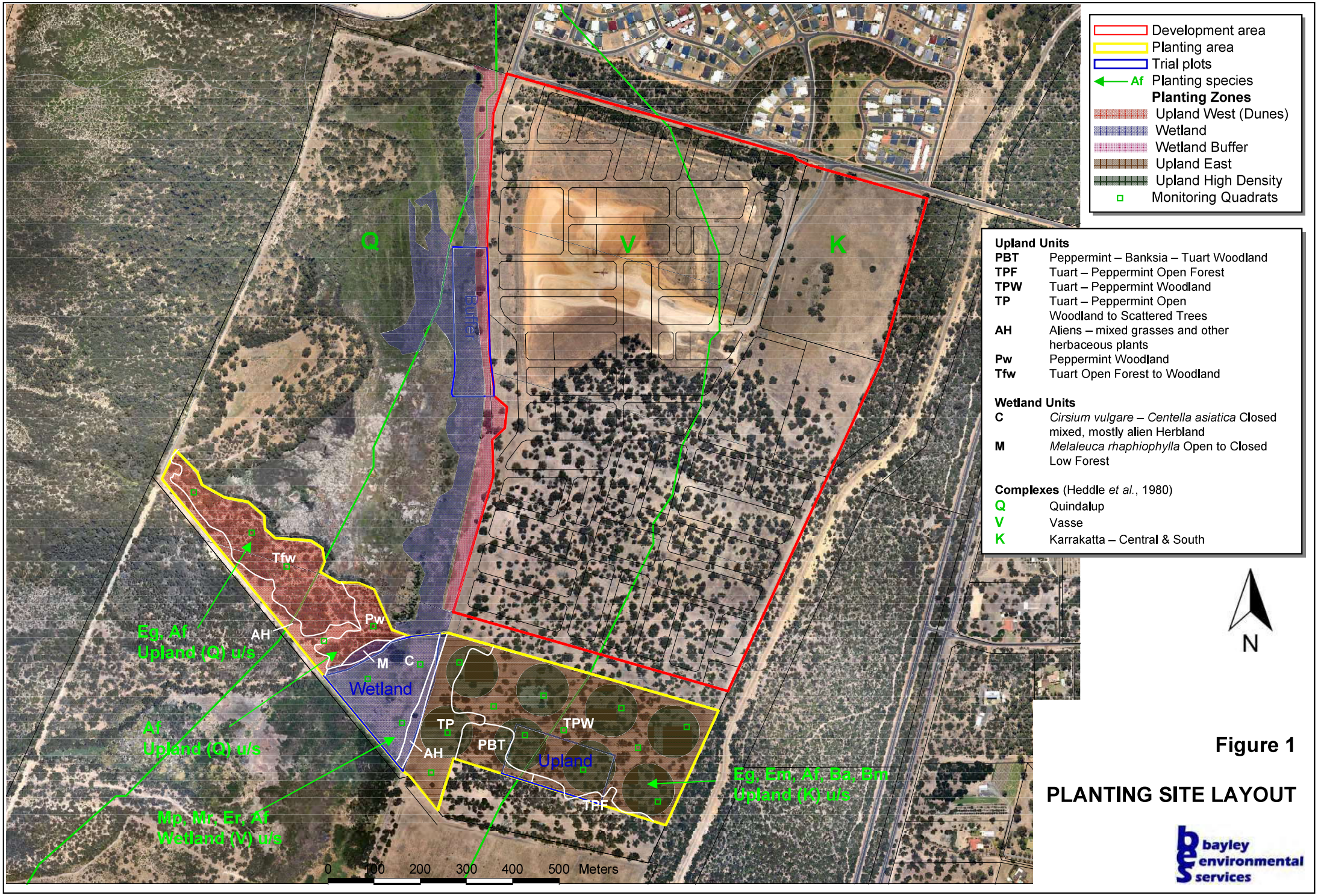


Figure 1

PLANTING SITE LAYOUT

bayley environmental services