

Urban Quarter Pty Ltd
Environmental Assessment Report

East of the Beach
Central Precinct

2 July 2021

61075/138,743 (Rev A)

JBS&G Australia Pty Ltd T/A Strategen-JBS&G

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1. Introduction

1.1 Overview

Urban Quarter Pty Ltd are proposing to develop the central portion of Lot 6, between the rail reserve and freeway reserve, in Eglinton (the site; Figure 7.1) for residential purposes. The site is located approximately 40 km north of Perth CBD within the City of Wanneroo and is 35.5 ha in area.

The Concept Plan is provided in Appendix A which depicts the proposed uses for the site, including:

- residential lots
- public open space (POS), and
- internal public road network

1.2 Purpose and scope of this document

This Environmental Assessment Report (EAR) has been prepared to support the proposed development of the central portion of Lot 6 Taronga Place (between the railway reserve and the freeway reserve) for residential purposes.

The purpose of this EAR is to demonstrate that all environmental considerations associated with the future land use and development scenario can be managed in accordance with policy requirements, and that development will be undertaken in accordance with EPBC approval 2017/7872. As such, the EAR addresses:

- applicable legislation, policy, and guidance,
- the environmental, bushfire and heritage characteristics of the site,
- potential impacts to the above characteristics associated with the proposed development,
- relevant approval requirements, and
- the spatial and management response of the development to ensure that any identified potential impacts can be mitigated or managed as to not result in a 'significant' impact.

2. Legislation, policies and guidelines

Key statutory and policy documents are listed below, and where specifically relevant to the proposed development, are described in detail in the following sections.

2.1 Federal

2.1.1 Environment and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Department of Agriculture, Water and the Environment (DAWE)). The EPBC Act aims to protect and manage nine Matters of National Environmental Significance (MNES) throughout Australia including:

- World Heritage Properties
- National Heritage Places
- wetlands of international importance (listed under the Ramsar Convention)
- listed threatened species and ecological communities
- migratory species protected under international agreements
- Commonwealth Marine Areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mines).

Prime Eglinton Pty Ltd under the management of Urban Quarter referred the proposal to develop Lot 6 Taronga Place, Eglinton (Plate 1) for residential and commercial development in 2017 (EPBC 2017/7872).



Plate 1. EPBC Act referral (2017/7872) boundary

On the 3rd of April 2017, the delegate for the Minister of the Environment determined that the project was a controlled action requiring assessment through preliminary documentation based on

potential impacts to listed threatened species and communities. Namely, the Carnaby’s Cockatoo and Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community.

Following assessment of the preliminary documentation, the proposal was approved subject to conditions. Conditions attached to the approval that have direct relevance for this EAR are summarised below (the full set of approval conditions are attached as Appendix B).

Table 2.1: Conditions relating to the development of the proposal area (EPBC 2017/7872)

Condition No.	Condition
1	The approval holder must not clear more than 92.25 hectares of Carnaby’s Cockatoo habitat of 41.29 hectares of Banksia Woodlands TEC within the project area (Plate 1).
2	Within 7 days prior to clearing of any area of Carnaby’s Cockatoo habitat, the approval holder must investigate and document all potential nesting trees within the area to be cleared to determine if there are any hollows that are being utilised, or are capable of being utilised, by the Carnaby’s Cockatoo for nesting. The investigation must be undertaken by a suitable qualified person.
2a	If any Carnaby’s Cockatoo(s) is detected utilising any hollow in any tree, the approval holder must: <ul style="list-style-type: none"> i. clearly identify and mark the nesting tree. ii. maintain a register of nesting trees. iii. only clear the identified nesting tree and vegetation within a 10-metre radius of that tree, if a suitably qualified person has verified that the hollow in the tree is no longer being used by Carnaby’s Cockatoo
2b	For each cleared hollow that is being utilised, or capable of being utilised by the Carnaby’s Cockatoo, the proponent must install at least three (3) artificial nesting hollows, where the artificial nesting hollows must be: <ul style="list-style-type: none"> i. installed within a 12 km radius of the cleared nesting tree(s) ii. constructed, positioned, erected, and maintained in accordance with relevant artificial hollow guidance, to maximise the likelihood that the artificial nesting hollows are utilised by the Carnaby’s Cockatoo. iii. installed before the commencement of the following breeding season for the Carnaby’s Cockatoo. iv. inspected and maintained at least annually to check for condition and evidence of Carnaby’s Cockatoo
3	To minimise impacts to the Carnaby’s Cockatoo and the Banksia Woodlands TEC, the approval holder must, within 5 years of commencement of the action, provide the Department with written evidence that at least 8 hectares of Carnaby’s Cockatoo habitat and Banksia Woodlands TEC has been transferred to the City of Wanneroo as Public Open Space for the purpose of conservation.
4	To mitigate impacts to the Carnaby’s Cockatoo and the Banksia Woodlands TEC, the approval holder must prepare and submit a Vegetation and Conservation Area Management Plan (VCAMP) for the approval of the Minister. The approval holder must not commence the actin unless the Minister has approved the VCAMP. The approved VCAMP must be implemented. <p>The VCAMP must be prepared in accordance with the Department’s Environmental Management Plan Guidelines and include, but not be limited to:</p> <ul style="list-style-type: none"> a. measures to prevent impacts to Carnaby’s Cockatoo habitat and Banksia Woodlands TEC during construction, including to: <ul style="list-style-type: none"> i. prevent and/or control site access, weeds, Phytophthora dieback, erosion, dust and fire. ii. delineate vegetation to be retained through, for example, the erection of temporary fencing or signage to avoid accidental clearing or disturbance outside of the impact area. b. objectives, targets and completion criteria for post construction rehabilitation measures such as site clean-up and weed management, including information on the mapping, monitoring and removal of noxious weeds. c. access control measures (e.g., fencing) to prevent or manage access to the areas of Public open Space proposed to be retained for conservation. d. bushfire control measures e. design and engineering controls to ensure that stormwater is not directed toward retained and adjacent areas of vegetation and that stormwater is appropriately managed t reduce hydrological impacts and prevent the mobilisation of dieback or other contaminants. f. clear objectives and performance indicators for all management actions, mitigation measures and practices prescribed by the VCAMP including details of the monitoring to be undertaken to demonstrate the effectiveness of the measures.

Condition No.	Condition
	<p>g. corrective actions for circumstances where an action, mitigation measure or practice prescribed by the VCAMP fails to meet, or is unlikely to meet, its prescribed objective, and trigger action points at which these corrective actions will be implemented.</p> <p>h. timeframes for implementing the above measures.</p>

The subject site for this EAR (the central precinct) is fully contained within the EPBC approval area and, as such, the proposed development will not result in any additional impacts to MNES that have not already been assessed.

2.2 State legislation

The environmental assessment has been conducted with reference to the following State legislation which provides for the environmental and heritage values, and bushfire risk addressed within this report:

- *Biodiversity Conservation Act 2016* (BC Act)
- *Environmental Protection Act 1986* (EP Act)
- *Biosecurity and Agriculture Management Act 2007* (BAM Act)
- *Rights in Water and Irrigation Act 1914* (RIWI Act)
- *Metropolitan Water Supply, Sewerage and Drainage Act 1909*
- *Aboriginal Heritage Act 1972 (WA)* (AH Act)
- *Contaminated sites Act 2003* (CS Act)
- Contaminated Sites Regulations 2006 (CS regulations)
- *Planning and Development Act 2005*.

2.2.1 Environmental Protection Act 1986

The *Environmental Protection Act 1986* (EP Act) is administered by the Environmental Protection Authority (EPA). The Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement, and management of the environment and for matters incidental to or connected with the foregoing. Part IV of the EP Act makes provisions for the EPA to undertake environmental impact assessment of significant proposals, strategic proposals, and land use planning schemes. The EPA uses environmental principles, factors and associated objectives as the basis for assessing whether a proposal or land use planning scheme's impact on the environment is acceptable.

2.2.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* has now replaced the *Wildlife Conservation Act 1950* (WC Act). On 3 December 2016, several parts of the new Act were enacted by the State Governor. The remaining parts of the Act and the associated Regulations came into effect on 1 January 2019. In addition to providing for the protection of flora and fauna, the *Biodiversity Conservation Act 2016* includes provisions for threatened ecological communities, threatening processes, critical habitats and environmental pests.

2.3 State Planning Policies

State planning policies (SPPs) are prepared and adopted by the WAPC under statutory procedures set out in part 3 of the *Planning and Development Act 2005*. The SPPs relevant to the proposed development are listed below:

- State Planning Policy 2.7: *Public Drinking Water Source Policy* (SPP 2.7)
- State Planning Policy 3.7: *Planning in Bushfire Prone Areas* (SPP 3.7)

- State Planning Policy 5.4: *Road and Rail Transport Noise and Freight Considerations in Land Use Planning – Section 5.3 Noise Criteria* (SPP 5.4)

2.4 Local government policies, strategies, and guidance

The City of Wanneroo has developed numerous policies, strategies and guidelines relevant to planning and the environment, as listed below. Reference to these documents has been made throughout the report where applicable to a specific environmental factor.

- Local Biodiversity Plan
- Local Planning Policy 1.1: Conservation Reserves
- Local Planning Policy 2.1: Residential Development
- Local Planning Policy 2.3: Site Works and Retaining for Residential Development
- Local Planning Policy 3.3: Fauna Management
- Local Planning Policy 4.1: Wetlands
- Local Planning Policy 4.3: Public Open Space
- Local Planning Policy 4.4: Urban Water Management
- Local Planning Policy 4.13: Caves and Karstic Features

The City of Wanneroo also provide specific guidance on the preparation of Environmental Management Plans. This guidance will form the basis of any management plans required to support the LSP application.

3. Existing environment

3.1 Land use

3.1.1 Current land use

The site is currently zoned Urban under the Metropolitan Region Scheme (MRS) and Urban development under the City of Wanneroo Local Planning Scheme (LPS) No. 2 (Figure 7.2).

The site is predominantly vegetated, broadly described as a low woodland of *Banksia* species with an overstorey of *Eucalyptus decipiens* and *E. todtiana* in areas. A portion of land (12.29 ha) has been cleared in April and May 2020 by the Western Australian Public Transport Authority (PTA) for construction of the Butler to Eglinton railway (Strategen-JBS&G 2021).

3.1.2 Previous land use

Based on a review of historical aerial imagery, the site has historically been covered by native vegetation with the majority subject to minimal disturbance. A portion of the site, which has since been cleared by PTA, had been historically cleared and subsequently regenerated. This portion of the site was classified as ‘regrowth’ in a flora and vegetation assessment undertaken in November 2016 (Strategen 2016).

3.2 Topography, geology and soils

Regional topographic contour mapping (DPIRD 2019) indicates that the site is undulating with elevation ranging between 30 m and 40 m Australian Height Datum (AHD) (Figure 7.3).

Surface geology of the site is characteristic of the Spearwood dunes and ranges from white to yellow sands to light brown sandy loam. Geological units within the site include the following (Gozzard, 1982; Figure 7.3):

- Sand (S7): pale and olive-yellow, medium to coarse-grained, sub-angular quartz with a trace of feldspar, moderately sorted of residual origin, and
- Limestone (LS1): light yellowish brown, fine to coarse-grained, sub-angular to well-rounded, quartz, trace of feldspar, shell debris, variably lithified surface kankar of eolian origin.

Soil landscape units within the site is dominated by the Karrakatta Sand Yellow Phase (211Sp_Ky) with smaller areas of Quindalup South oldest dune Phase (211Qu_Q1) and Spearwood Sand Phase (211Sp_Sp) (Figure 7.3). These are described in Table 3.1.

Table 3.1: Soil landscape units within the site

Soil landscape unit	Description
Karrakatta Sand Yellow Phase (211Sp_Ky)	Low hilly to gently undulating terrain. Yellow sand over limestone at 1-2 m. <i>Banksia</i> spp. woodland with scattered emergent <i>Eucalyptus gomphocephala</i> and <i>E. marginata</i> and a dense shrub layer.
Quindalup South oldest dune Phase (211Qu_Q1)	The oldest phase. Dunes or remnants with low relief. Calcareous sands have organic staining to about 30 cm, overlying pale brown sand with definite cementation below 1 m.
Spearwood Sand Phase (211Sp_Sp)	Irregular banks of karst depressions. Some limestone outcrop. Shallow brown sands. <i>Banksia</i> spp. woodland with emergent <i>E. gomphocephala</i> and <i>E. marginata</i> ; dense shrub layer.

The Karrakatta Sand Yellow Phase has nil to moderate risk of waterlogging, 7% of the map unit has a high risk of water erosion and 13% has a very high risk of wind erosion (DPIRD 2020). The presence of tamala limestone indicates that there the site has highly variable permeability rates, ranging from less than 0.1m/day to more than 10m/day depending on conditions. Infiltration testing for Lot 6

west of the railway reserve indicates a good drainage rate for sand material across the site (CMW 2018).

3.2.1 Karst

The Western Australian Speleological Group (WASG) have prepared a Karstic Risk Zone dataset that identifies areas of low, medium, and high risk of Karst occurrence within the City of Wanneroo. Within this dataset, the site was found to have a medium to high risk of karst. A Preliminary Karst Assessment was undertaken by CMW Geosciences in 2016 to quantify the presence of karstic features, and subsequently inform a geotechnical assessment (CMW 2016). The results of the assessment is provided in Appendix C, and the area within the site likely to be susceptible to instability due to the presence of karst is known on Figure 7.3 (CMW 2016; 2018). The remainder of the site is considered to have a very low risk of instability due to karst and can be managed through normal geotechnical investigation and design.

3.3 Hydrology

3.3.1 Groundwater

There are three aquifers underlying the Precinct; each assigned the name of the major geological unit in which the aquifer occurs (DWER 2017). In descending order of depth from natural surface they are:

- Superficial Swan Aquifer (unconfined)
- Leederville Aquifer (confined)
- Yarragadee North (confined).

The Superficial Swan and the Leederville aquifers are both fully allocated while the Yarragadee North aquifer has allocation available. There are two groundwater licences immediately adjacent to the site, however none are located within. The details of these licenses are provided in Table 3.2

Table 3.2: Groundwater licenses in proximity to the site

License No.	Applicant	Expiry	Allocation (KL) Perth Superficial Swan	Location in relation to the site
153683	Draws and Son Pty Ltd	04/04/2027	54,850	Immediately west
167859	Peet Alkimos Pty Ltd	18/12/2021	154,338	Immediately south

Regional historical maximum groundwater contour mapping (DWER 2006) indicates that the water table is situated at approximately 3 m AHD to 4 mAHD, which equates to approximately 28.3 to 32.5 m below ground level (based on regional topographic contours). Groundwater flows in an east to west direction within the site.

3.3.2 Surface water

There are no surface water bodies or watercourses located within or in close proximity to the site. Surface water is largely retained within the site due to the high permeability of the underlying soils, and the wetland being up-gradient of the site (Cossil & Webley 2018).

3.3.2.1 Geomorphic wetlands

The nature of the protection and management Swan Coastal Plain wetlands should be afforded is guided by the appropriate management category they have been assigned. These management categories are listed in Table 3.3.

Table 3.3: Management categories of Geomorphic Wetlands

Management category	Management objective
Conservation Category Wetlands (CCW)	To preserve wetland (natural) attributes and functions
Resource Enhancement Wetlands (REW)	To restore wetlands through maintenance and enhancement of wetland functions and attributes

Management category	Management objective
Multiple Use Wetlands (MUW)	To use, develop and manage wetlands in the context of water, town and environmental planning

There are no mapped geomorphic wetlands or water bodies within the site. The nearest wetland is a Sumpland Resource Enhancement Wetland (REW) (UFI 8016) located adjacent to the Eastern Precinct 350 m from the site (Figure 7.4).

3.3.3 Public Drinking Water Source Area

The *Metropolitan Water Supply, Sewerage and Drainage Act 1909* (MWSSD Act) and the *Country Areas Water Supply Act 1947* (CAWS Act) identify and categorise public drinking water source areas as catchment areas, water reserves, or underground water pollution control areas.

The site is located within a Priority 3 (P3) Public Drinking Water Source (PDWSA) Perth coastal and Gwelup Underground Water Pollution Control Area. A 300 m Well-head Protection Zone (WPZ), applied to groundwater abstraction wells within P3 PDWSAs, is located approximately 230 m southwest of the site boundary. P3 DPWSAs are defined and managed to maintain the quality of the drinking water source with the objective of risk management. P3 areas occur within PDWSAs where the land is zoned for urban and commercial or light industrial uses. Within P3 areas, drinking water sources need to co-exist with higher intensity land uses compared to P1 and P2 areas (DoW 2016).

3.4 Acid sulfate soils

Acid sulfate soils (ASS) are naturally occurring, iron-sulfide rich soils, sediments or organic substrates, formed under waterlogged conditions. If exposed to air, these sulfides can oxidise and release sulfuric acid and heavy metals. This process can occur due to drainage, dewatering or excavation.

A search of the Swan Coastal Plain ASS risk map (DWER 2017) indicates that there is no known risk of ASS occurring within 3 m of the natural soil surface of the site (Figure 7.5). As such and in consideration of the known geology (Spearwood Dunes) and DER (2015) ASS investigation criteria, ASS investigations are not considered necessary for the Central Precinct.

3.5 Vegetation and flora

3.5.1 Desktop assessment

A desktop assessment was undertaken based on publicly available datasets detailing broad vegetation and flora characteristics of the site. In addition to this, the results of database data available through NatureMap and the Protected Matters Search Tool within 5 km of the site were used to identify conservation significant flora species and ecological communities likely to occur within the area.

3.5.1.1 Bioregion

The site occurs within the Perth subregion of the Swan Coastal Plain region under the Interim Biogeographic Regionalisation of Australia (IBRA).

3.5.1.2 Pre-European vegetation

The National Objectives and Targets for Biodiversity Conservation 2001-2005 recognises that a retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia's biological diversity is to be protected (ANZECC 2000). The Western Australian Environmental Protection Agency has previously adopted the ANZECC 30% retention target; however, under Position Statement No. 2, they also adopted a 10% level of the pre-clearing extent of vegetation that was regarded as being a level representing 'endangered' (EPA 2000). The Position Statement has subsequently been replaced with the EPA's Environmental Factor Guideline (EPA

2016) which describes a more qualitative approach to biodiversity conservation and no longer mentions percentage targets.

Notwithstanding, State Planning Policy 2.8: Bushland policy for the Perth Metropolitan Region (2010), recognises the Perth Metropolitan Region as a ‘constrained area’ and establishes a target of 10% retention for each vegetation complex.

Vegetation Associations

Remnant vegetation within the site is mapped as belonging to the Guilderton 949 vegetation system association, based on state-wide vegetation mapping by Beard et al. (2013). Guilderton 949 is described as a low woodland of *Banksia* sp.

As detailed in Table 3.4, the Guilderton 949 vegetation association has undergone some historic clearing, with approximately 56.42% remaining at the state scale and 57.28% remaining at the IBRA region scale (GoWA 2019a). Approximately 46.30% is estimated to remain within the City of Wanneroo (GoWA 2019b).

Table 3.4: State, local and regional representation of the Guilderton 949 vegetation association

Region	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Western Australia	218,193.94	123,104.02	56.42
Swan Coastal Plain IBRA Region	209,983.26	120,287.93	57.28
Perth IBRA subregion	184,475.82	104,128.96	56.45
City of Wanneroo	37,138.40	17,196.34	46.30

Vegetation complexes

Vegetation complex mapping of the Swan Coastal Plain was completed by Heddle et al. (1980) and considers soils, landforms, and floristics. As shown in Figure 7.6, the site is within the Cottesloe Complex - Central and South. The Cottesloe Complex – Central and South is described as a mosaic of woodland of *Eucalyptus gomphocephala* (Tuart), open forest of *E. gomphocephala*, *E. marginata* (Jarrah), *Corymbia calophylla* (Marri) and closed heath on the limestone outcrops (GoWA 2019b). Approximately 32.16% of the Cottesloe Complex – Central and South remains within the Swan Coastal Plain IBRA region, while 41.65% persists within the City of Wanneroo (Table 3.5; GoWA 2019b).

Table 3.5: Local and regional representation of the Southern River vegetation complex

Region	Pre-European Extent (ha)	Current Extent (ha)	% Remaining
Swan Coastal Plain IBRA Region	45,299.61	14,567.87	32.16
City of Wanneroo	13,313.58	5,545.39	41.65

3.5.1.3 Conservation significant flora

Threatened flora is afforded protection under the BC Act at a State level, and under the EPBC Act at the Commonwealth level. Under the BC Act, taking of Threatened flora requires authorisation from the State Minister of Environment. Under the EPBC Act, approval is required from the Commonwealth Minister of Environment for significant impacts to Threatened flora.

In addition, at a State level, the DBCA lists ‘Priority’ flora which are considered possibly threatened species that do not meet survey criteria or are otherwise data deficient.

Searches were conducted using NatureMap and the EPBC Protected Matters Search Tool (PMST) to identify flora species of conservation significance potentially occurring in the Survey Area. Species identified with the potential to occur within the site are listed in Table 3.6. Previous surveys within the site did not record any flora species of conservation significance. The likelihood for each species to occur within the site, based on the presence of suitable habitat, is presented in Table 3.6.

Table 3.6: Conservation significant flora species identified as potentially occurring within the site

Taxon name	Conservation status		Likelihood of occurrence within the site
	State	Commonwealth	
<i>Caladenia huegelii</i>	Threatened	Endangered	Possible. Suitable habitat present, not identified during survey. Revised: unlikely to occur.
<i>Diuris micrantha</i>	Threatened	Vulnerable	Unlikely to occur. Suitable habitat absent.
<i>Drakaea elastica</i>	Threatened	Endangered	Unlikely to occur. Suitable habitat absent.
<i>Lepidosperma rostratum</i>	Threatened	Endangered	Unlikely to occur. Suitable habitat absent.
<i>Leucopogon maritimus</i>	N/A	P1	Possible. Suitable habitat present, not identified during survey. Revised: unlikely to occur.
<i>Hibbertia spicata</i> subsp. <i>leptotheca</i>	N/A	P3	Unlikely to be present. Suitable habitat absent.
<i>Stylidium maritimum</i>	N/A	P3	Possible. Suitable habitat present, not identified during survey. Revised: unlikely to occur.
<i>Conostylis pauciflora</i> subsp. <i>euryrhipis</i>	N/A	P4	Possible. Suitable habitat present, not identified during survey. Revised: unlikely to occur.
<i>Conostylis pauciflora</i> subsp. <i>pauciflora</i>	N/A	P4	Possible. Suitable habitat present, not identified during survey. Revised: unlikely to occur.

3.5.1.4 Threatened and Priority ecological communities

Threatened Ecological Communities (TECs) are afforded protection under the BC Act if listed at a State level, and under the EPBC Act if listed at a Commonwealth level. The BC Act requires approval from the Minister of Environment for direct and indirect modification of a Threatened Ecological Community. Under the EPBC Act, approval is required from the Commonwealth Minister of Environment for significant impacts to Commonwealth listed TECs.

In addition, at a State level, the DBCA lists 'Priority' ecological communities (PECs) which are possible threatened ecological communities that do not meet survey criteria or that are not adequately defined.

DBCA database searches indicated that the Banksia Woodlands of the Swan Coastal Plain ecological community, listed under the EPBC Act as Critically Endangered and by DBCA as Priority 3, is known to occur on site.

3.5.2 Site survey

A flora and vegetation survey was undertaken by Strategen (2017) within the site in late October and early November 2016. The survey area covered a broader area than the site and is shown on Figure 7.7.

3.5.2.1 Vegetation types

A total of 103 taxa were recorded within the broader Lot 6 Taronga Place survey area. Strategen (2017) noted that the current subject site contains only a fraction of the species recorded over the

entirety of Lot 6, with comparatively lower biodiversity. A total of four native vegetation units and three units of modified vegetation were recorded within the site. Since the survey was undertaken, 12.29 ha of vegetation has been cleared by PTA under EPBC 2017/7872 for the construction of the Butler to Eglinton railway. The area of each vegetation type currently present within the site is described in Table 3.7 and shown on Figure 7.8.

Table 3.7: Vegetation types within the site

Vegetation type	Description	Area (ha)
BaBmEt	<i>Banksia attenuata</i> , <i>Banksia menziesii</i> Low Woodland with <i>Eucalyptus todtiana</i> woodland over Open Heath of <i>Allocasuarina humilis</i> and <i>Xanthorrhoea preissii</i> over Low Open Shrubland of <i>Hibbertia hypericoides</i> over mixed Herbland.	5.66
Bs	Tall Open Scrub of <i>Banksia sessilis</i> over patches of <i>Melaleuca huegelii</i> over Low Shrubland of <i>Melaleuca acerosa</i> , <i>Grevillea preissii</i> and <i>Calothamnus quadrifidus</i> over Open Sedgeland of <i>Lomandra maritime</i> , <i>Desmocladius asper</i> , <i>Mesomelaena pseudostygia</i> and <i>Lepidosperma squamatum</i> .	8.90
Ed	Woodland of <i>Eucalyptus decipiens</i> with scattered <i>E. todtiana</i> and patches of <i>Allocasuarina fraseriana</i> , over Open Heath to Open Shrubland of <i>Hibbertia hypericoides</i> and <i>Calothamnus quadrifidus</i> .	2.85
EdBa	Woodland to Low Open Woodland of <i>Eucalyptus decipiens</i> and <i>Banksia attenuata</i> with Scattered <i>Eucalyptus todtiana</i> and patches of <i>Allocasuarina fraseriana</i> , over Tall Open Scrub to Shrubland of <i>Banksia sessilis</i> and <i>Jacksonia sternbergiana</i> over Open Heath to Open Shrubland of <i>Allocasuarina humilis</i> , <i>Acacia saligna</i> and <i>Xanthorrhoea preissii</i> over Low Shrubland of <i>Hibbertia hypericoides</i> and <i>Calothamnus quadrifidus</i> .	0.30
Subtotal (native vegetation)		17.70
Regrowth	Recently cleared with re-emergent understory species including <i>Hibbertia hypericoides</i> , <i>Acacia pulchella</i> , <i>Allocasuarina humilis</i> , <i>Calothamnus quadrifidus</i> and <i>Conostylis aculeata</i> .	3.82
Planted trees		0.60
Pasture		0.92
Subtotal (modified vegetation)		5.34
Cleared land	Land subject to clearing by PTA in 2020	12.29
Total (native vegetation, modified vegetation and cleared land)		35.33

3.5.2.2 Vegetation condition

Vegetation condition within the site ranges from ‘Completely Degraded’ to ‘Excellent’. A breakdown of vegetation condition across the site is detailed in Table 3.8 and shown on Figure 7.9.

Table 3.8: Vegetation condition within the site

Vegetation condition	Area (ha)	Proportion (%) of site
Excellent	6.91	19.56
Very Good to Excellent	6.33	17.91
Very Good	4.46	12.63
Good to Degraded	3.82	10.81
Completely Degraded	1.52	4.30
Cleared (no condition)	12.29	34.78
Total	35.34	100

3.5.2.3 Conservation significant flora

Strategen (2017) did not record any flora species within the site that are considered conservation significant under the EPBC Act, BC Act, or by DBCA. The site was found to contain proportionately fewer flora species than the broader survey area (Strategen 2017).

3.5.2.4 Threatened and Priority ecological communities

Strategen (2017) identified two vegetation types within the survey area, BaBmEt and BaBmBp, that were assessed as being associated with the Banksia Woodland TEC/PEC. There is currently 5.66 ha of Banksia Woodland TEC/PEC within the site equivalent to the area of BaBmEt (Figure 7.8).

The results of floristic analysis indicated these two vegetation types are consistent with Floristic Community Type (FCT) 28 (Strategen 2017). While FCT 28 is associated with the Banksia Woodland TEC/PEC, it is not individually listed as a State PEC or TEC.

3.6 Fauna and habitat

3.6.1 Desktop assessment

Searches were conducted using a 5 km buffer in NatureMap and EPBC Protected Matters Search Tool (PMST) to identify fauna species of conservation significance potentially occurring in the Survey Area. The results of these searches found one species of conservation significance that is known to occur within the site (*Calyptorhynchus latirostris* - Endangered) and one that may potentially occur within the site (*Neelaps calonotos* – Priority 3). As the site does not intersect any geomorphic wetland areas or open water bodies, migratory bird wetland species have not been considered. Similarly, marine species have been omitted given the distance from the site to suitable habitat. A list of the species of conservation significance that may occur within 5 km of the site is provided in Table 3.6.

Table 3.9: Conservation significant flora species within 5 km of the site

Taxon name	Conservation status		Likelihood of occurrence within the site
	State	Commonwealth	
Birds			
<i>Botaurus poiciloptilus</i> Australasian Bittern	Endangered	Endangered	Unlikely – outside of known distribution area and habitat is not present on site.
<i>Calidris canutus</i> Red Knot,	Endangered	Endangered & Migratory	Unlikely – outside of known distribution area and habitat is not present on site.
<i>Calidris ferruginea</i> Curlew Sandpiper	Critically Endangered	Critically Endangered & Migratory	Unlikely – outside of known distribution area and habitat is not present on site.
<i>Calyptorhynchus latirostris</i> Carnaby's Cockatoo,	Endangered	Endangered	Present on site. Evidence of foraging recorded by Strategen (2017).
<i>Leipoa ocellata</i> Malleefowl	Vulnerable	Vulnerable	Unlikely – outside of known distribution area and habitat is not present on site.
<i>Rostratula australis</i> Australian Painted Snipe	Endangered	Endangered	Unlikely – outside of known distribution area and habitat is not present on site.
<i>Oxyura australis</i> Blue-billed Duck	P4	N/A	Unlikely – habitat is not present on site.
Mammals			
<i>Dasyurus geoffroii</i> Chuditch, Western Quoll	Vulnerable	Vulnerable	Unlikely – outside of known distribution area and habitat is not present on site.
<i>Hydromys chrysogaster</i> Water-rat, Rakali	P4	N/A	Unlikely – habitat is not present on site.
<i>Isoodon fusciventer</i> Quenda	P4	N/A	Likely - Strategen (2017) did not record evidence of occurrence on site.
Reptiles			
<i>Neelaps calonotos</i> Black-striped Snake	P3	N/A	Possible – suitable habitat present within the area however only two historical records within 20 km of the site.

The site occurs within the known habitat range of Carnaby's Cockatoo based on the Carnaby's Cockatoo Recovery Plan (Parks and Wildlife 2013), listed as Threatened under the BC Act and as Endangered under the EPBC Act. According to the EPBC Act Referral guidelines for three threatened black cockatoo species (DSEWPac 2012) the site is not situated within the range of Forest Red-Tailed Black Cockatoos or Baudin's Black Cockatoos.

3.6.2 Site survey

Based on the desktop assessment, the site is known to provide habitat for Carnaby’s Cockatoo, likely to provide habitat for Quenda, and potentially provide habitat for the Black-striped Snake. The Black striped snake is considered unlikely to be present within the site given there are only two historical records of the species occurring within 20 km of the site.

Strategen (2017) recorded evidence of Carnaby’s Cockatoo occurring within the site. No observation of Quenda within the site was recorded (Strategen 2017).

Strategen (2017) recorded three vegetation types within the site, BaBmEt, Bs and regrowth, which contain flora species that are utilised by Carnaby’s Cockatoo for foraging. A total of 22.45 ha within the site was described as having some foraging value for the species, of which 18.68 ha is considered to provide ‘Moderate’ to ‘Very Poor’ quality foraging habitat. An assessment of foraging habitat quality was undertaken based on the presence, density, and condition of suitable foraging species. The results of this are presented in Table 3.10 and on Figure 7.10.

Highest quality foraging habitat for Carnaby’s Cockatoo was noted within BaBmEt, which contains high densities of Black Cockatoo food species including *Banksia attenuata*, *Banksia menziesii*, *Eucalyptus todtiana* and *Banksia sessilis* at canopy and midstorey levels, as well as *Mesomelaena pseudostygia* and other suitable food species within the understorey.

No potentially significant trees with a diameter at breast height (DBH) greater than 500 mm were recorded during the surveys. Therefore, the site is not considered to provide breeding or roosting habitat for the species.

Table 3.10: Black Cockatoo foraging habitat quality within the site

Black Cockatoo foraging habitat quality	Area within the site (ha)	Proportion (%) of total habitat
Good	2.72	12.11
Moderate to Good	2.94	13.10
Moderate	9.20	40.97
Very Poor	3.82	17.02
Very Poor to Nil	3.77	16.80
Total	22.45	63.52

Quenda (Priority 4) are considered likely to occur within the site, based on the vegetation types recorded. Quenda have a patchy distribution through the Jarrah and Karri forest and the Swan Coastal Plain, and prefers scrubby, and often swampy, vegetation with a dense cover up to 1 m high. The species often feeds in adjacent forest and woodland that is burnt on a regular basis, as well as in areas of pasture and cropland lying close to dense cover. Most of the vegetation across the site is expected to provide some habitat for Quenda.

3.7 Conservation areas

State Planning Policy 2.8: Bushland Policy for the Perth Metropolitan Region (SPP 2.8) aims to provide a policy and implementation framework that ensures bushland protection and management issues throughout the Perth Metropolitan Region are adequately addressed and integrated with broader land use planning and decision-making (WAPC 2010). The policy predominantly deals with two distinct subjects, Bush Forever areas and local bushland areas.

In accordance with SPP 2.8, proposals must recognise regionally significant bushland and outline methods by which it will avoid, minimise, and offset any likely adverse impacts it will have on regionally significant bushland.

There are no conservation areas located within the site. The nearest is Bush Forever site 288 (Yanchep National Park) which is situated approximately 300 m northeast of the site. Bush Forever sites located in close proximity to the site are listed in Table 3.11 and shown on Figure 7.11.

Table 3.11: Bush Forever sites in proximity to the site

Bush Forever site ID	Name	Distance and direction from the site
288	Yanchep National Park	300 m northeast
130	Link between Yanchep and Neerabup National Parks	200 m southeast
129	Bernard Road Bushland, Carabooda	900 m east
397	Coastal strip from Wilbinga to Mindarie	1.7 km southwest

3.8 Contamination

The *Contaminated Sites Act 2003* (CS Act) defines contamination as having a substance present in land or water above background concentrations that presents a risk of harm to human health or the environment. The act also provides for the identification, recording, management, and remediation of contaminated sites. Contamination commonly occurs through accidental leakage and spillage, or poor site management practices.

According to the DWER (2018) contaminated sites database, there are no registered sites within or adjacent to the site. A review of historical aerial photography from 1965 to present day visually indicates that the precinct was fully cleared by 1977. A portion of the site was used for broad acre agricultural purposes (2000) while most of the site has supported native vegetation since 1965 (Landgate 2018).

3.9 Bushfire risk

The site is located within a designated bushfire prone area, according to the Western Australian State map of Bush Fire Prone Areas (DFES 2019). As a result, a Bushfire Management Plan (BMP) is required to accompany the Structure Plan to address the following requirements of *State Planning Policy 3.7 Planning in Bushfire Prone Areas* (SPP 3.7), namely Policy Measure 6.3:

- a bushfire hazard level (BHL) assessment or where lot layout is known, a Bushfire Attack Level (BAL) contour assessment to determine the indicative acceptable BAL ratings across the site,
- identification of any bushfire hazard issues arising from the above assessment, and
- assessment against the bushfire protection criteria requirements contained within the Guidelines demonstrating compliance can be achieved in subsequent planning stages.

A BMP has been prepared in accordance with Guidelines for Planning in Bushfire Prone Areas (WAPC 2017) and should be read in conjunction with this EAR.

3.10 Heritage

3.10.1 Indigenous heritage

The *Aboriginal Heritage Act 1972* (AHA Act) aims to protect Aboriginal heritage by registering Aboriginal sites (places and/or objects) that are of cultural importance to Aboriginal people. Any proposal to use or alter an area of land, for purposes such as research or development, must first determine if Aboriginal sites occur within the proposed area. If an Aboriginal site is found to occur, permission must be sought from the Minister for Aboriginal Affairs before that land can be used or altered in any way.

According to the Department of Planning, Lands and Heritage – Aboriginal Heritage Places mapping tool (DPLH 2017) there are no Registered or Other Heritage Places located within the site. Two Registered sites are located within 1 km of the site. Site 17451 occurs 700 m north while Site 1018 is 1 km to the east (Figure 7.12). Neither of these will be impacted by the development.

3.10.2 European heritage

European cultural heritage places are recorded in a variety of different heritage listings. Some of these listings give statutory protection to heritage places, through requirements for heritage-related approvals or referrals.

No state or local heritage places are located within the site (State Heritage Office 2018). The nearest is located 300 m northeast of the site and is associated with Yanchep National Park (Figure 7.12).

4. Potential impacts and proposed management

4.1 Soils and hydrology

4.1.1 Existing environment and potential impacts

4.1.1.1 Erosion and sedimentation

Clearing of vegetation, construction earthworks, and altered surface water regimes have the potential to destabilise soils and, if unmanaged, result in erosion of the site and sedimentation of surrounding drainage infrastructure and vegetation. These potential impacts will be effectively managed through the mitigation measures detailed in 4.1.2 and are considered unlikely to be significant.

4.1.1.2 Surface water

There are no surface water bodies present within the site, therefore surface water considerations are limited to the REW located 350 m northeast. Surface water alteration within the site may have indirect impacts on the REW through potentially altered quantity and/or quality of water discharged to the wetland.

The management of surface water is outlined in the Local Water Management Strategy (LWMS) submitted with the structure plan. This LWMS has been developed in response to the civil engineering and stormwater management requirements of the site.

4.1.1.3 Ground water

Groundwater levels within the site ranges from 3 m to 4 m AHD, flowing in an east to west direction. Regional groundwater contours indicate that groundwater within the site is situated approximately 28.3 m to 32.5 m below the natural ground level (DWER 2018).

The site is located within a Priority 3 PDWSA, within the Perth Coastal and Gwelup underground water pollution control area.

Development within the site may result in an alteration to groundwater quality and flow dynamics, including potential increased rates of discharge (Lerner 2002; Garcia-Fresca 2005), increased leaching of nutrients, and any dewatering or groundwater abstraction that may be required. During the preparation of an EAR to support a Local Structure Plan over the entirety of Lot 6, the Department of Water advised that groundwater reserves are fully allocated, and water is not readily available for abstraction. Therefore, any abstraction will utilise an existing groundwater license that covers the site. This license allocation is proposed to be used for construction and irrigation requirements within areas of POS.

The extent of impacts on groundwater flow are dependent on the amount and location of sub-surface infrastructure (McGrane 2016), sewage management, and the depth and quantity of excavation requiring dewatering. Any dewatering for construction activities will be temporary and localised, with detailed drawdown requirements to be outlined at the subdivision stage as part of a Construction and Environmental Management Plan (CEMP).

4.1.2 Proposed management

The potential impacts of development on geology, soils, and hydrology are outlined in Table 4.1.

Table 4.1: Management measures for topography, geology and soils

Parameter	Management measure	Timing and responsibility
Karstic Risk Zone	<ul style="list-style-type: none"> Within the karstic risk zone, sand cover above limestone is required to be a minimum of 10 m In areas where sand cover is below 10m, or are decreased during development activities, a bridging layer of crushed 	Responsibility of the developer during project design and construction.

Parameter	Management measure	Timing and responsibility
	limestone to 2 m thick will be applied with a 1 m thick surface layer of free-draining sand.(CMW 2018).	
Erosion and sedimentation	<p>A Construction Environmental Management Plan (CEMP) will be prepared to support the LSP including measures to address:</p> <ul style="list-style-type: none"> • Installation of erosion and sediment control measures to effective control site drainage, soil erosion and sediment runoff, • Controls on height and slope gradient of stockpiles on site, • Staging of works to limit the amount of exposed earth at any given time, and • Utilising water carts where appropriate. 	Responsibility of the developer at subsequent stages of development.
Surface water hydrology	<ul style="list-style-type: none"> • Drainage and stormwater management will be undertaken in accordance with the LWMS, meeting the requirements of Better Urban Water Management (WAPC 2008). • A CEMP will be prepared to support the subdivision stage to define specific stormwater management measures informed by the LWMS. 	
Groundwater management	<ul style="list-style-type: none"> • Groundwater abstraction will be localised and temporary, under an existing license within the site. • Development will be connected to reticulated water and sewage in accordance with the requirements for residential development within P3 PDWSAs (DoW 2018). • Further management manages are provided in the LWMS. 	

4.1.3 Predicted outcome

The implementation of management measures identified in Table 4.1 are considered sufficient to result in no significant impacts to geology, soils and hydrology through erosion, sedimentation, nutrient export, and instability caused by karst risk.

Drainage basins have been located within readily impervious soils to minimise stagnant water and inundation and to minimise their environmental impact.

4.2 Vegetation and flora

4.2.1 Receiving environment and potential impacts

The site is comprised of 17.70 ha of native vegetation, 5.34 ha of modified vegetation and 12.29 ha of cleared land. The proposed development will necessitate the clearing of up to 15.83 ha of native vegetation. Clearing of approximately 1.93 ha of intact native vegetation and 0.07 ha of modified vegetation (pasture) will be retained and enhanced within the northern area of Public Open Space.

Proposed development will impact up to 5.49 ha of vegetation representative of the Banksia Woodlands TEC, and 16.75 ha of Black Cockatoo foraging habitat ranging from 'Very Poor' to 'Moderate' quality. The impacts to Banksia Woodland TEC were assessed as part of the EPBC approval EPBC 2017/7872. No species of conservation significance will be impacted by the proposed clearing.

Some indirect impacts to retained vegetation and that within adjacent areas, during the construction and operational phases of development. These include impacts of dust, vibration, and altered hydrology. In particular, these impacts may occur to retained areas of high-quality vegetation, some of which is representative of Banksia Woodland TEC and Black Cockatoo habitat, which will be managed through the measures discussed in section 4.2.2.

4.2.2 Proposed management

Impacts to flora and vegetation will be managed through the measures identified in Table 4.2.

Table 4.2: Management measures for flora and vegetation

Parameter	Management measure	Timing and responsibility
Vegetation retention for conservation	<p>An area of vegetation conservation has been delineated in the northern portion of the site. This has been located to maximise conservation value by providing direct connectivity to an adjacent area of conservation managed by the City of Wanneroo. The alignment of the conservation area in the context of the surrounding area is shown on Figure 7.13. The conservation area contains the following values:</p> <ul style="list-style-type: none"> • 1.93 ha of intact native vegetation in ‘Very Good to Excellent’ condition, • 0.17 ha of Banksia Woodland TEC, • 1.93 ha of Black Cockatoo foraging habitat of which 1.76 ha is in ‘Moderate’ condition, and 0.17 ha is in ‘Moderate to Good’ condition. <p>Within the POS area, there is a further 0.07 ha of degraded land which will be subject to revegetation and enhancement to provide a contiguous area of high-quality vegetation with the adjacent conservation area.</p> <p>A Conservation Area Management Plan (or equivalent) will be prepared in accordance with the City of Wanneroo’s Environmental Management Plan Guidelines (2018) during subdivision stage. The plan will include:</p> <ul style="list-style-type: none"> • Measures to minimise risk of unapproved clearing, incidental damage through material laydown and vehicle movement, and incidental spread of weed and/or pathogen species through vegetative or soil material., and • Measures to enhance vegetation including the establishment of locally sourced tubestock, implementation of dieback and weed hygiene measures, restricting access through pathway delineation, constructing fencing/bollards to restricted areas, and designing educational signage. 	Responsibility of the developer during the project design phase at local structure plan and subdivision stage.
Vegetation retention within POS	<p>Additional opportunities for conservation will be identified and implemented at subdivision stage. As shown in Appendix A an area of POS in the southern portion of the site (0.94 ha in area) has been identified for potential tree retention subject to detailed design and engineering constraints. Opportunities for further vegetation retention within this area will be explored at subsequent development stages and, where possible, will be incorporated into landscaping design.</p>	
Indirect impacts to retained and adjacent vegetation	<p>Potential indirect impacts to areas of retained and adjacent vegetation will be outlined in a CEMP prepared and implemented over the site. This will include measures such as:</p> <ul style="list-style-type: none"> • Use of water carts where appropriate to keep dust down, • Clearly delineate clearing boundaries and communicate to all construction and site personnel at induction (digital copies as well as physical fencing of retained vegetation), • Undertaking clearing in a staged manner to limit the amount of bare earth and, therefore potential for dust, at any given time, • Control access to areas of vegetation at all times. 	Responsibility of the developer prior to and for the duration of clearing and construction activities.

4.2.3 Predicted outcome

The conservation of 1.93 ha of intact native vegetation in ‘Very Good to Excellent’ condition presents a strong environmental outcome, particularly when considered in the broader context of the surrounding area. The retention and conservation of this area will contribute to an increase in contiguous vegetation conservation. An area currently managed by the City of Wanneroo for conservation of 4.36 ha will be increased to 6.36 ha.

Additionally, measures of preventing indirect impact to areas of vegetation identified for retention and contained within adjacent Lots will be implemented as per Table 4.2. The predicted outcome is no degradation of retained or adjacent vegetation through measures of controlling dust and vibration, prevention of unlawful clearing, and no significant alteration of hydrology.

4.3 Fauna and habitat

4.3.1 Existing environment and potential impacts

The site is known to provide habitat for Carnaby’s Cockatoo, with evidence recorded during a site survey in 2016 (Strategen 2017). Furthermore, the site is considered likely to provide habitat for Quenda based on database records and vegetation present on site.

A total of 18.68 ha of Black Cockatoo habitat is currently within the site ranging in quality from ‘Very Poor’ to ‘Good’ foraging quality for Carnaby’s Cockatoos. Proposed development will require the clearing of up to 16.75 ha of this, of which 2.72 ha (16.2%) is of ‘Good’ quality, 2.77 ha (16.5%) is of ‘Moderate to Good’ quality, 7.44 ha (44.4%) is of ‘Moderate’ quality, and 3.82 ha (22.8%) is of ‘Very Poor’ quality.

The majority of the vegetated portion of the site is considered to provide suitable habitat for Quenda given the presence of scrubby vegetation with a dense understorey (Strategen 2017). However, no individuals were recorded within the site during the 2016 survey.

Fauna that occur on site may also be disturbed or injured by construction and clearing activities, through increased movement of vehicles and plant in the area, human access, and removal of habitat. These impacts, as well as impacts to habitat, will be minimised through the implementation of measures described in Table 4.3

4.3.2 Proposed management

Impacts to terrestrial fauna will be managed through the measures identified in Table 4.2.

Table 4.3: Management measures for terrestrial fauna

Parameter	Management measure	Timing and responsibility
Retention of habitat	<p>An area of conservation has been delineated in the northern portion of the site. This has been located to maximise conservation value by providing direct connectivity to an adjacent area of conservation managed by the City of Wanneroo. The alignment of the conservation area in the context of the surrounding area is shown on Figure 7.13. The conservation area contains the following values:</p> <ul style="list-style-type: none"> 1.93 ha of Black Cockatoo foraging habitat of which 1.76 ha is in ‘Moderate’ condition, and 0.17 ha is in ‘Moderate to Good’ condition, 1.93 ha of Quenda habitat. <p>A Conservation Area Management Plan (or equivalent) will be prepared in accordance with the City of Wanneroo’s Environmental Management Plan Guidelines (2018) during subdivision stage. The plan will include measures to protect and enhance fauna habitat such as:</p> <ul style="list-style-type: none"> Measures to minimise risk of unapproved clearing, incidental damage through material laydown and vehicle movement, and incidental spread of weed and/or pathogen species through vegetative or soil material that may degrade habitat, and Measures to enhance vegetation including the establishment of locally sourced tubestock, implementation of dieback and weed hygiene measures, restricting access through pathway delineation, constructing fencing/bollards to restricted areas, and designing educational signage. 	<p>Responsibility of the developer during the project design phase at subdivision stage.</p>

Parameter	Management measure	Timing and responsibility
Impacts to fauna	<ul style="list-style-type: none"> • A CEMP will be prepared and implemented at a subsequent stage of development. This will include measures to limit the impacts of development on fauna within the area, including those that are conservation significant (Black Cockatoos and Quenda) as well as common species that possibly utilise the area. These measures will include: <ul style="list-style-type: none"> ○ Fauna trapping and relocation prior to clearing of habitat, where appropriate (i.e., where intact vegetation is identified) and/ or a suitably qualified fauna contractor supervising clearing works. ○ Taking a staged approach to clearing to allow fauna to leave the area and clearing in a pattern that allows fauna to move into adjacent patches of vegetation. ○ Training and protocols for on-site personnel including means of managing any fauna located on site and the reporting of injuries. • Opportunity for habitat creation using suitable landscaping species and debris (felled hollows etc). 	

4.3.3 Predicted outcome

The implementation of the measures outlined in Table 4.3 is expected to result in no significant direct, indirect, or cumulative impacts to Black Cockatoos, Quenda, or other native fauna species through development.

Given the site contains Black Cockatoo foraging habitat, opportunities for retention have been considered and a conservation area delineated in the norther portion of the site. Additional opportunities to retain suitable habitat will be explored through subsequent stages of development to retain as much habitat as possible within areas of landscaping, POS, verges, and median strips.

Approval under EPBC 2017/7872 has specified that a minimum of 8.0 ha of Black Cockatoo habitat must be retained over the entire approval area. Within this stage of the project (the central precinct) 1.93 ha will be retained. Further retention will be delineated at subsequent development stages across the EPBC approval area.

A number of large patches of potentially suitable Black Cockatoo foraging habitat and Quenda habitat surround the site. Large patches are evident within and adjacent to Yanchep National Park, Gnangara-Moore State Forest and Neerabup Nature Reserve and National Park, all of which are within 6 km of the site (Figure 7.14). It is expected that the presence of large habitat patches in the immediate vicinity of the site, including areas of conservation linked to the site, impacts of the proposed development will not be significant.

4.4 Bushfire

As a result of the bushfire prone status of the site (DFES 2019) a Bushfire Management Plan (BMP) is required to accompany the local structure plan to address the following requirements of State Planning Policy 3.7 Planning in Bushfire Prone Areas (SPP 3.7), namely Policy Measure 6.3:

- A bushfire hazard level (BHL) assessment or where lot layout is known, a Bushfire Attack Level (BAL) contour assessment to determine the indicative acceptable BAL rating across the site,
- Identification of any bushfire hazard issues arising from the above assessment, and
- Assessment against the bushfire protection criteria requirements contained within the Guidelines. Demonstrating compliance can be achieved in subsequent development stages.

A BMP has been prepared in accordance with the Guidelines for Planning in Bushfire Prone Areas and should be read in conjunction with this EAR.

5. Conclusion

This report has been prepared to support the Local Structure Plan for the central precinct of Lot 6 Taronga Place, Eglinton. This report provides a description of the environmental values present within and adjacent to the site proposed for residential development, a discussion of the potential impacts to those values, and how they will be managed.

The site has previously formed part of an EPBC referral, for which approval was provided with conditions in year (EPBC 2017/7872).

The proposed development is not expected to result in significant impact to any environmental values, that have not already been subject to assessment under EPBC 2017/7872. The avoidance and mitigation measures presented in this EAR and environmental management plans that will be prepared and implemented and implemented to support the Local Structure Plan will ensure no unconsidered environmental impacts will arise through development.

The environmental management plans that will be prepared to support subsequent planning stages that have been identified in this document will provide greater detail and specific implementation protocols including monitoring and reporting requirements and procedures.

6. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

Strategen-JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by Strategen-JBS&G, and should not be relied upon by other parties, who should make their own enquires.

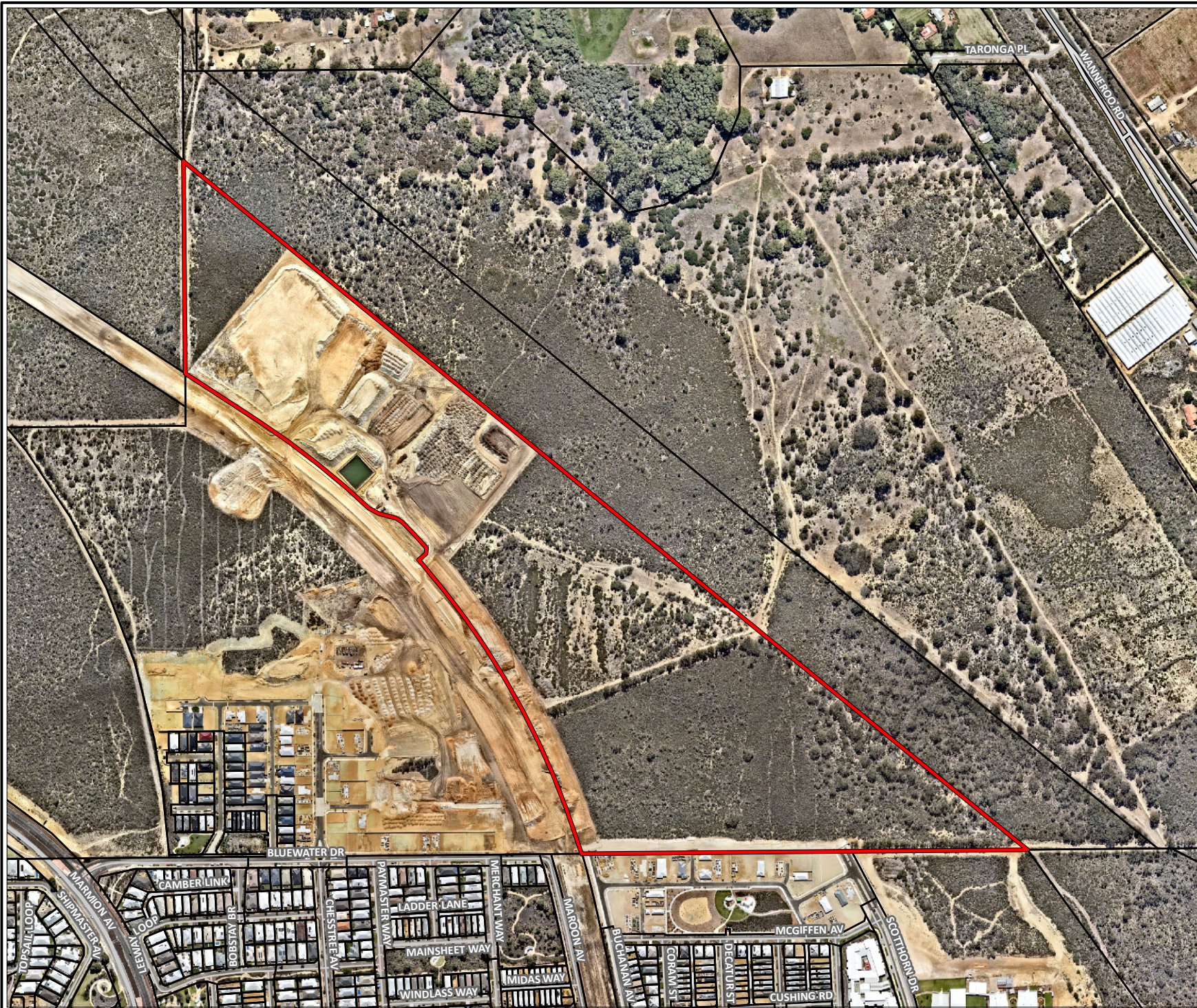
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, Strategen-JBS&G reserves the right to review the report in the context of the additional information.

7. Figures



Legend

- The site
- Cadastral boundary
- Highways
- Main road
- Minor road
- Pedestrian way



Job No: 61075

Client: Urban Quarter Pty Ltd

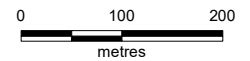
Version: A

Date 2/07/2021

Drawn By: hsullivan

Checked By: CT

Scale 1:7,500 at A4

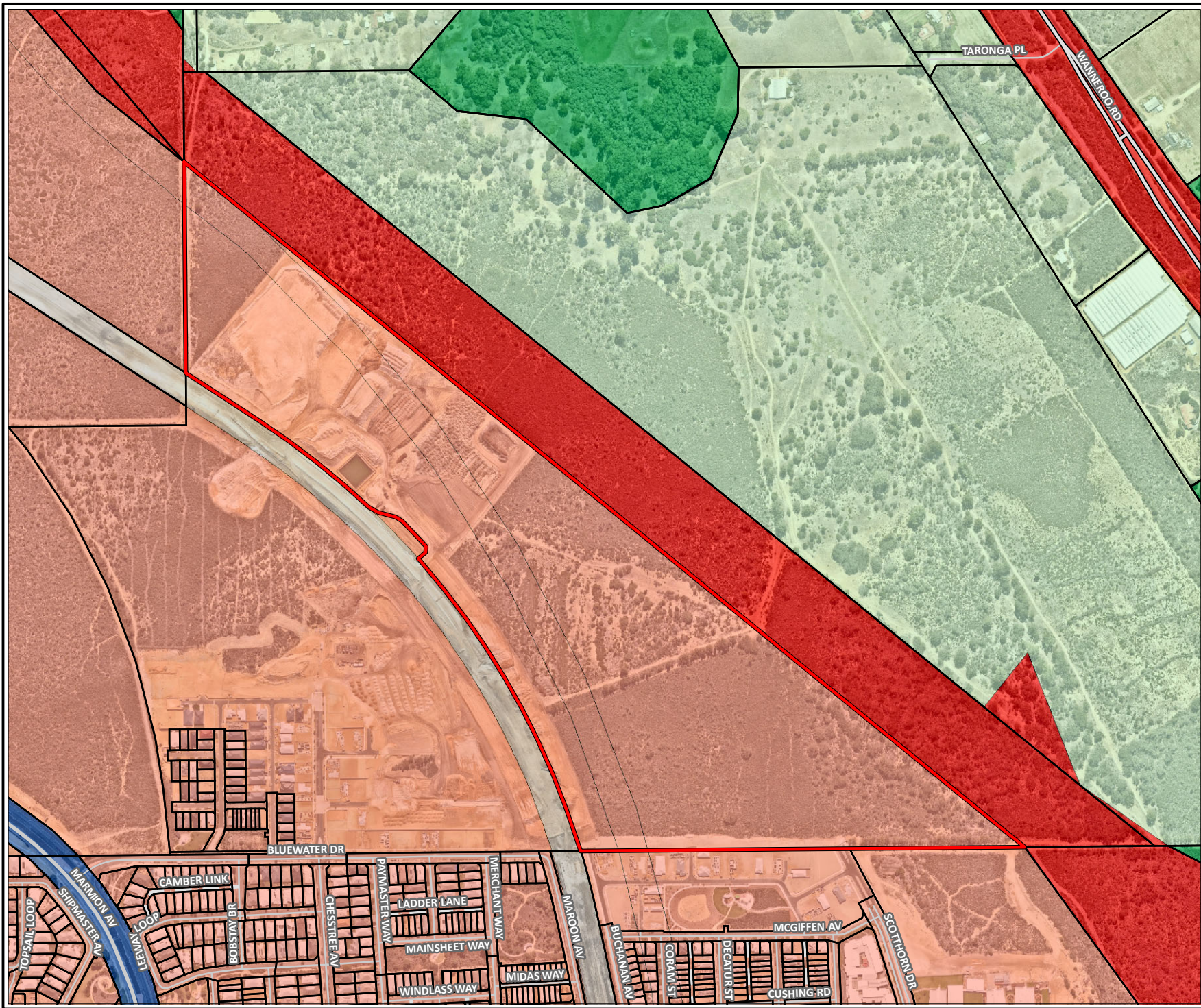


Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

THE SITE

FIGURE 7.1



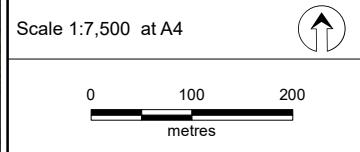
- Legend**
- The site
 - Cadastral boundary
 - Existing Region Scheme Zones and Reserves
 - Other regional roads
 - Parks and recreation
 - Primary regional roads
 - Railways
 - Rural
 - Urban
 - Highways
 - Main road
 - Minor road
 - Pedestrian way



Job No: 61075

Client: Urban Quarter Pty Ltd

Version: A	Date 2/07/2021
Drawn By: hsullivan	Checked By: CT



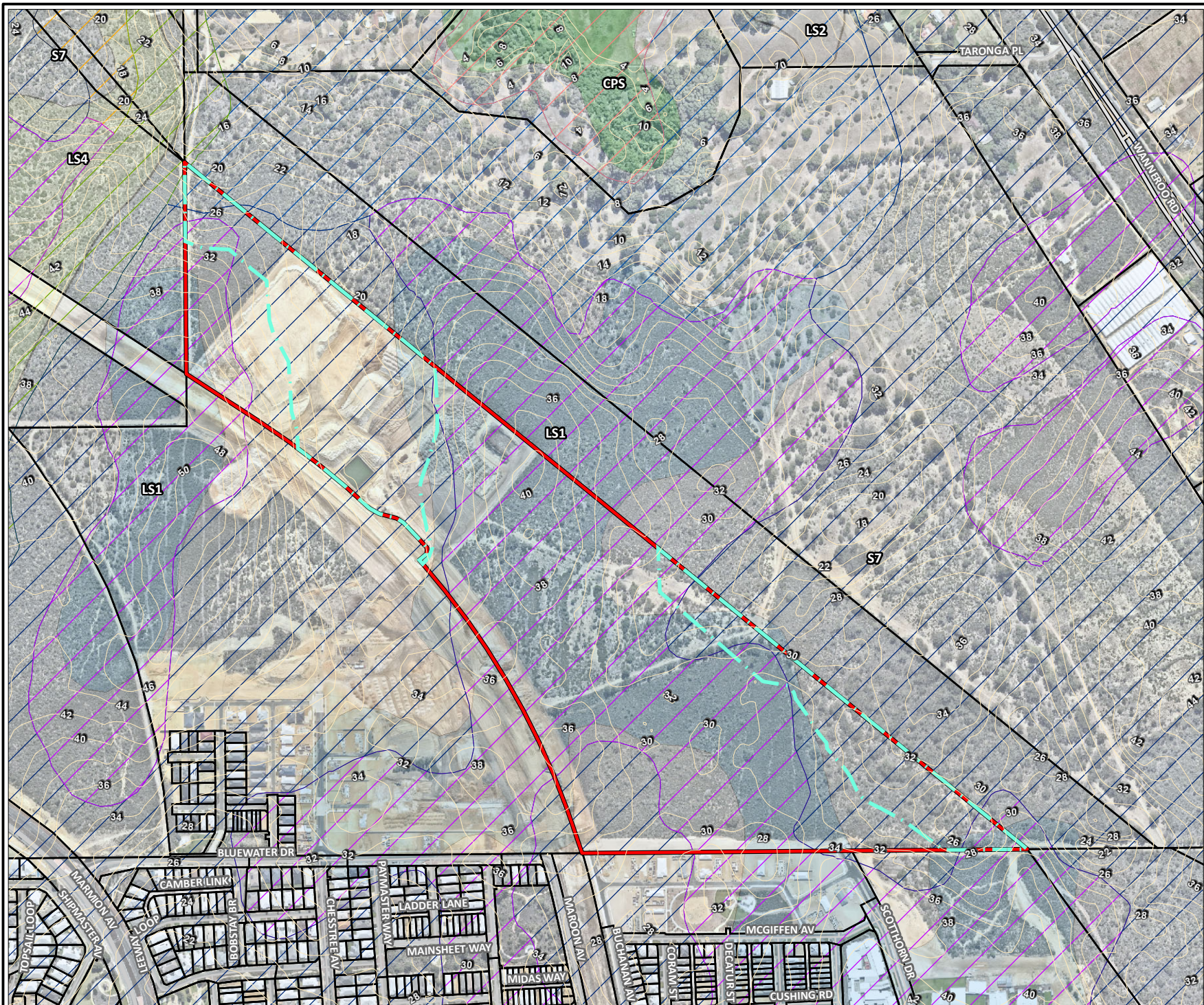
Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

SURROUNDING LAND USE

FIGURE 7.2

File Name: W:\Projects\1)\OpenUrban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_2_LandUse.mxd
 Image Reference: www.nearmap.com© - Imagery Date: 10 April 2021.



- Legend**
- The site
 - Cadastral boundary
 - Karst Risk Zone within the site
 - Soil landscape units
 - Karrakatta Sand Yellow Phase
 - Karrakatta shallow soils Phase
 - Quindalup South deep sand flat Phase
 - Quindalup South oldest dune Phase
 - Spearwood Sand Phase
 - Spearwood wet, swamp Phase
 - Geology
 - Cps
 - LS4
 - S7
 - LS1
 - LS2
 - Topographic contours (mAHD)
 - Highways
 - Main road
 - Minor road
 - Pedestrian way



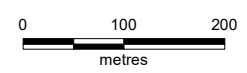
Job No: 61075

Client: Urban Quarter Pty Ltd

Version: A Date 2/07/2021

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Scale 1:7,500 at A4



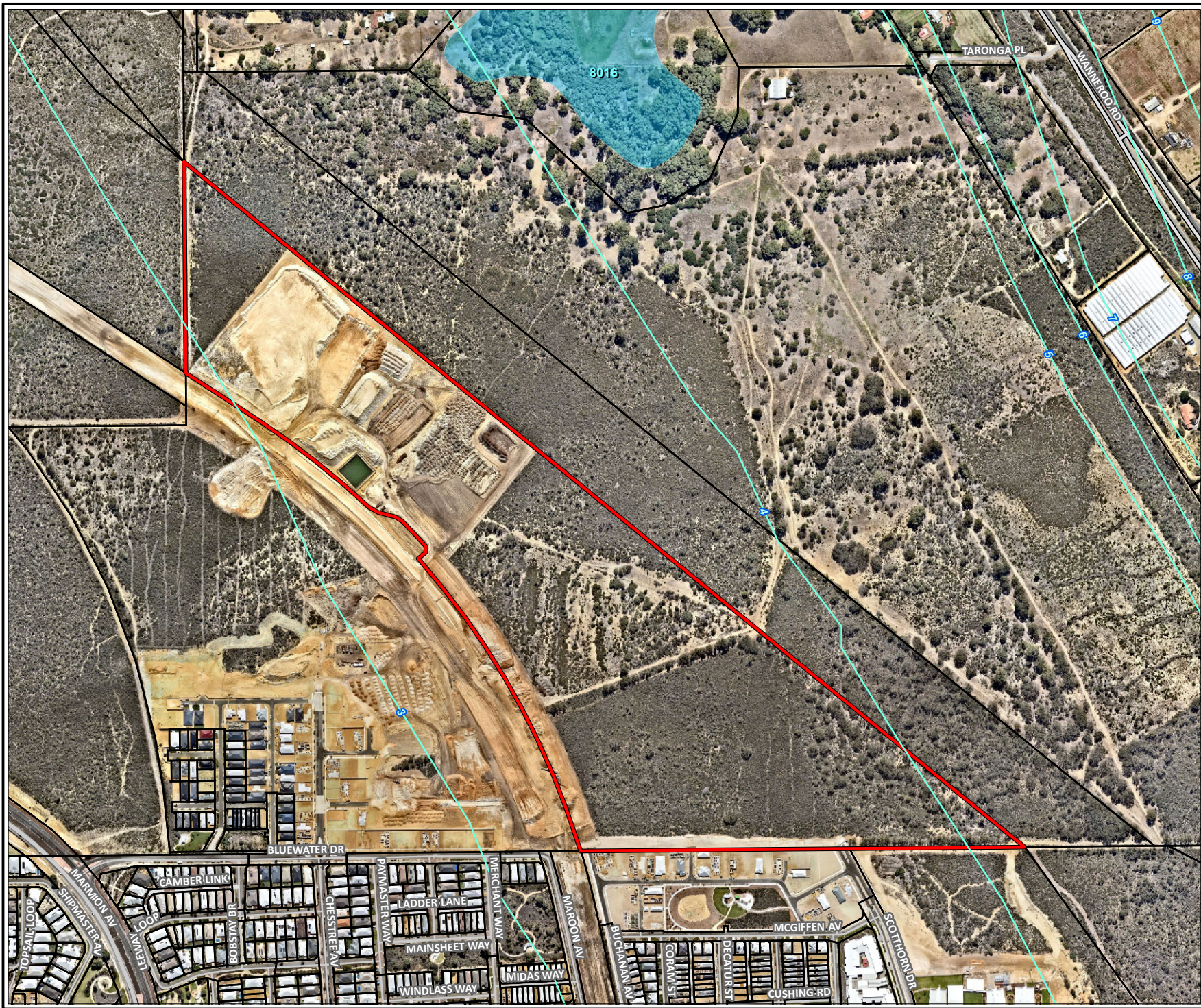
Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

TOPOGRAPHY, GEOLOGY AND SOILS

FIGURE 7.3

File Name: W:\Projects\1\Open\Urban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_3_TopoGeoSoils.mxd
Image Reference: www.nearnmap.com © - Imagery Date: 10 April 2021.



Legend

- The site
- Geomorphic Wetlands (DBCA)
- Resource enhancement
- Groundwater contour - maximum (mAHD)
- Highways
- Main road
- Minor road
- Pedestrian way



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 Client: Urban Quarter Pty Ltd
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 Drawn By: hsullivan Checked By: CT

Scale 1:7,500 at A4

0 100 200
 metres

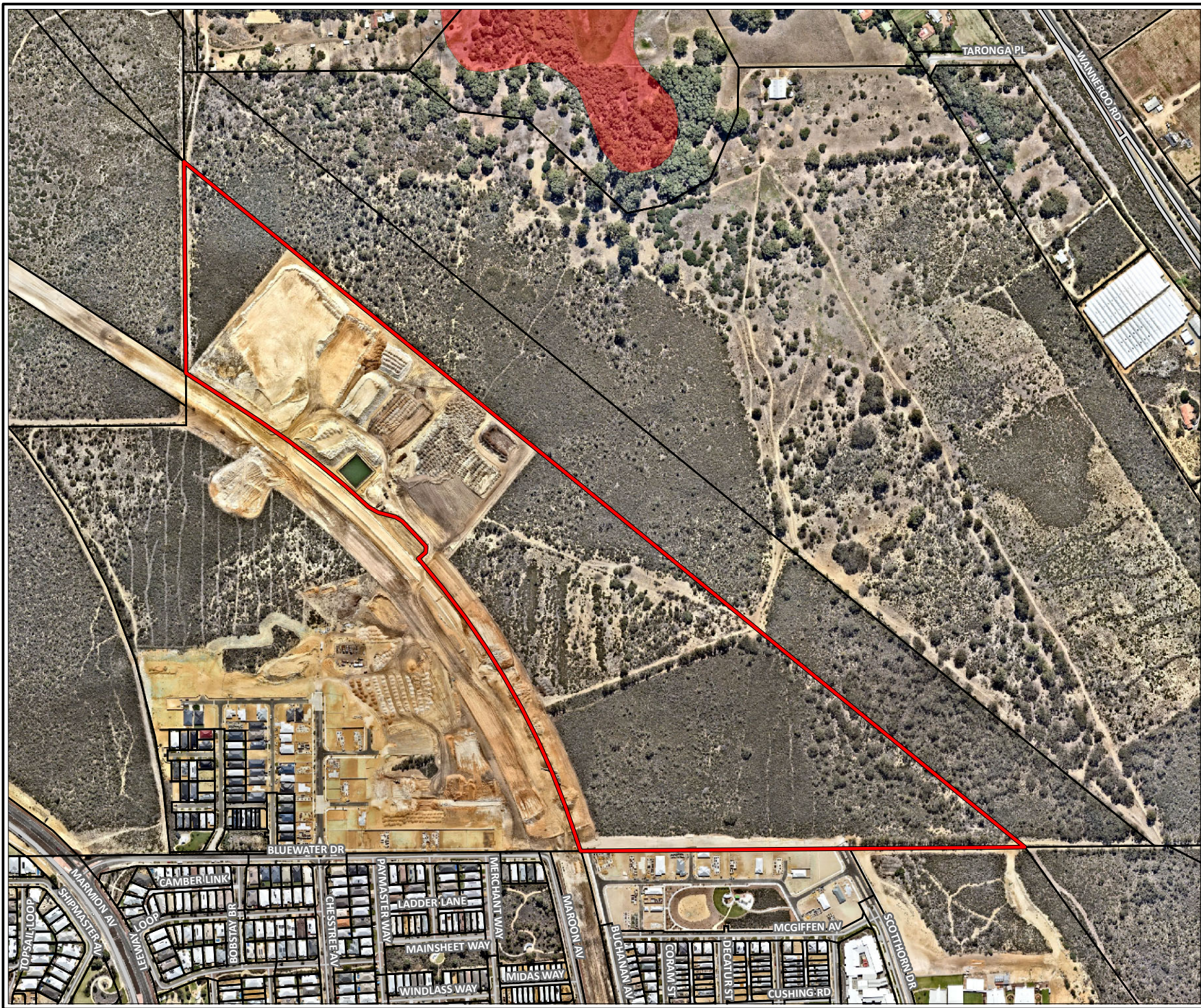
Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
 Lot 6 Taronga Place, Eglinton WA**

HYDROLOGY AND WETLANDS

FIGURE 7.4

File Name: W:\Projects\1\OpenUrban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_4_HydroWetlands.mxd
 Image Reference: www.nearmap.com © - Imagery Date: 10 April 2021.



- Legend**
- The site
 - Cadastral boundary
 - Acid sulfate soil risk mapping (DWER)
 - High to moderate risk
 - Highways
 - Main road
 - Minor road
 - Pedestrian way



Job No: 61075
 Client: Urban Quarter Pty Ltd
 Version: A Date 2/07/2021
 Drawn By: hsullivan Checked By: CT

Scale 1:7,500 at A4

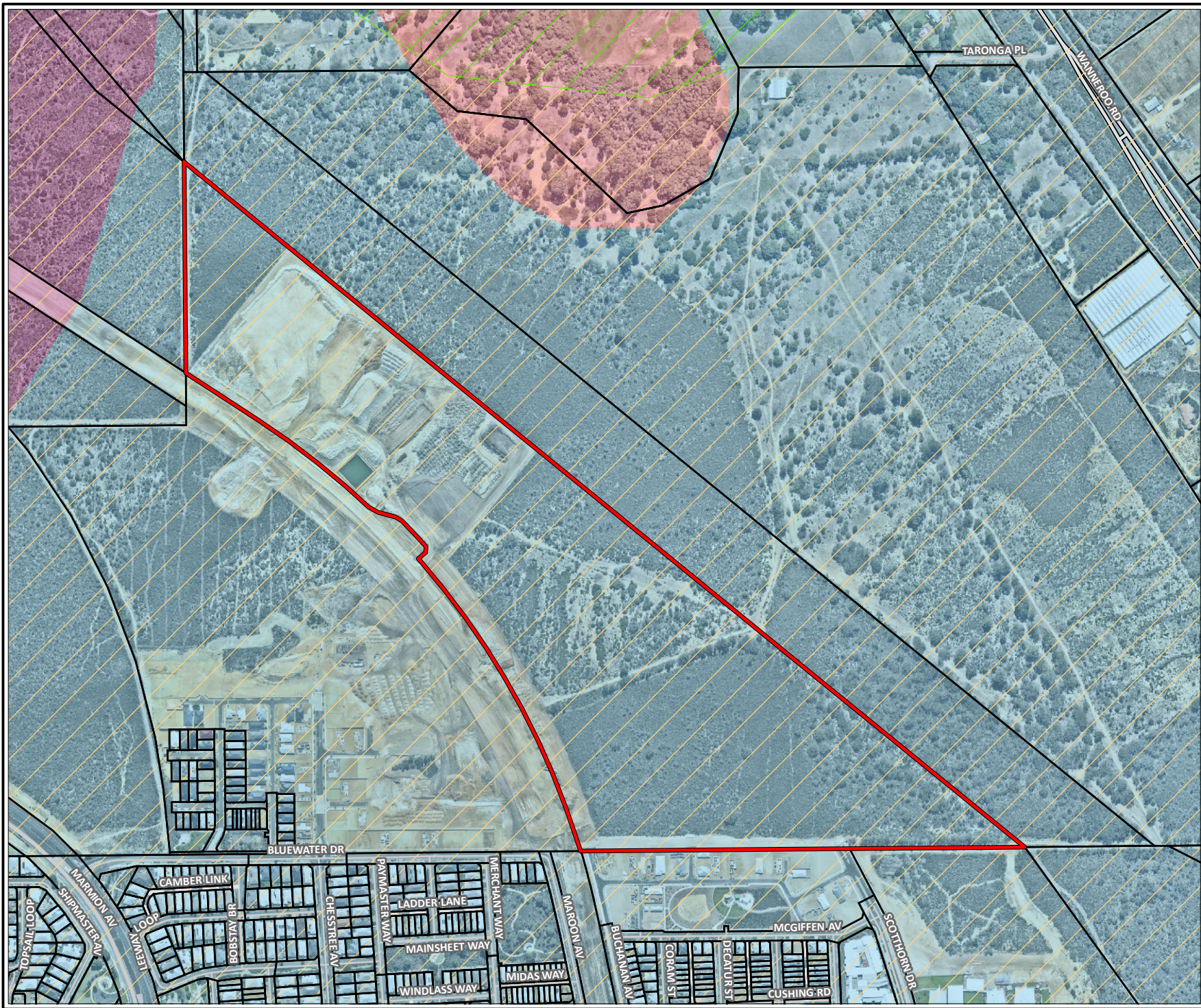
0 100 200
 metres

Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
 Lot 6 Taronga Place, Eglinton WA**

ACID SULFATE SOILS

FIGURE 7.5



- Legend**
- The site
 - Cadastral boundary
 - Vegetation associations
 - Guilderton 949
 - Spearwood 998
 - Vegetation complexes
 - Cottesloe Complex-Central and South
 - Herdsman Complex
 - Quindalup Complex
 - Highways
 - Main road
 - Minor road
 - Pedestrian way



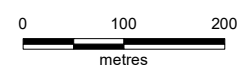
Job No: 61075

Client: Urban Quarter Pty Ltd

Version: A Date 2/07/2021

Drawn By: hsullivan Checked By: CT

Scale 1:7,500 at A4



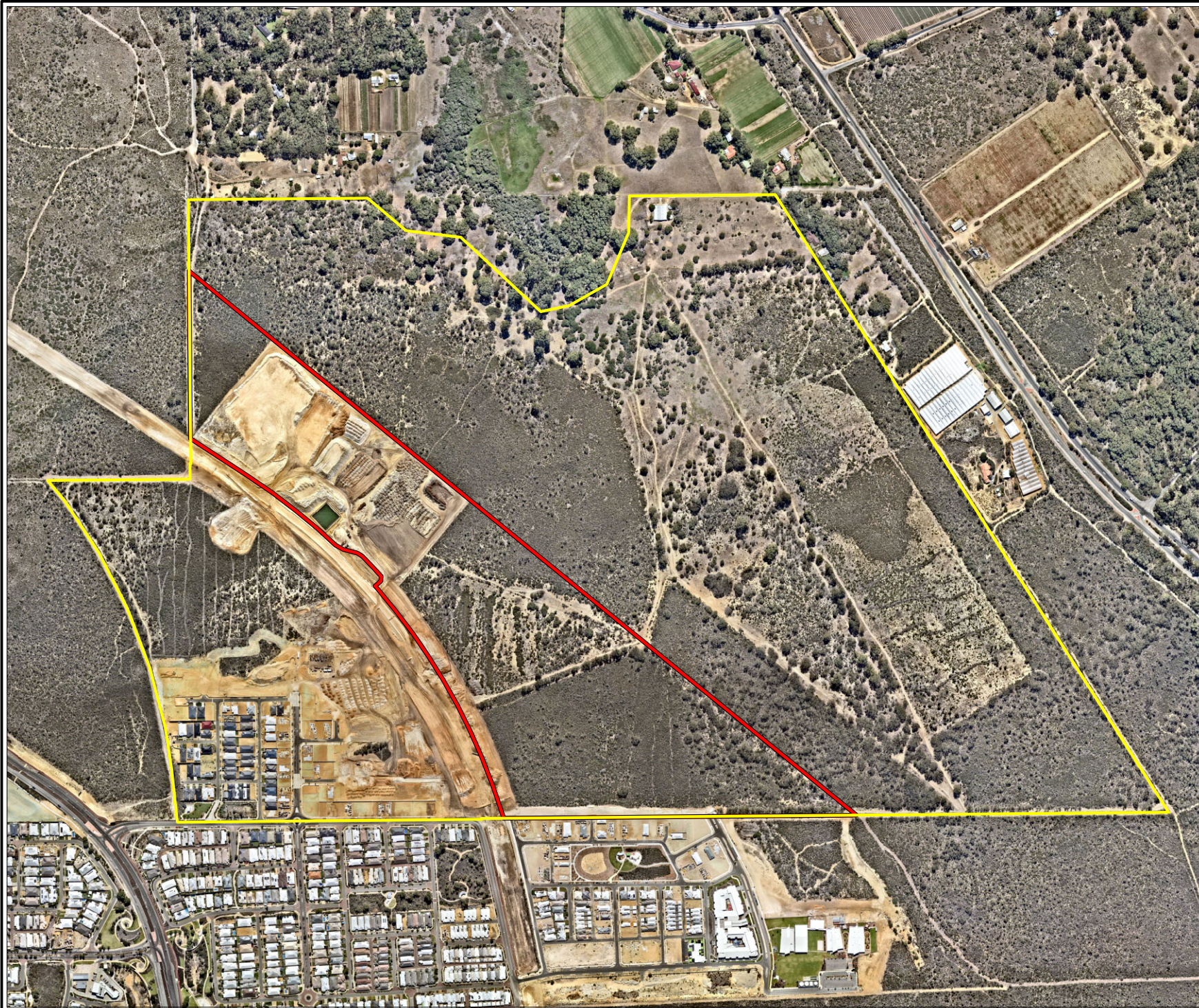
Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

**REGIONAL VEGETATION
ASSOCIATIONS AND COMPLEXES**

FIGURE 7.6

File Name: W:\Projects\1\OpenUrban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_6_RglVeg.mxd
Image Reference: www.nearmap.com© - Imagery Date: 10 April 2021.



Legend

- The site
- Survey area



Job No: 61075

Client: Urban Quarter Pty Ltd

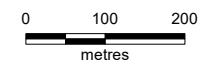
Version: A

Date 2/07/2021

Drawn By: hsullivan

Checked By: CT

Scale 1:9,500 at A4

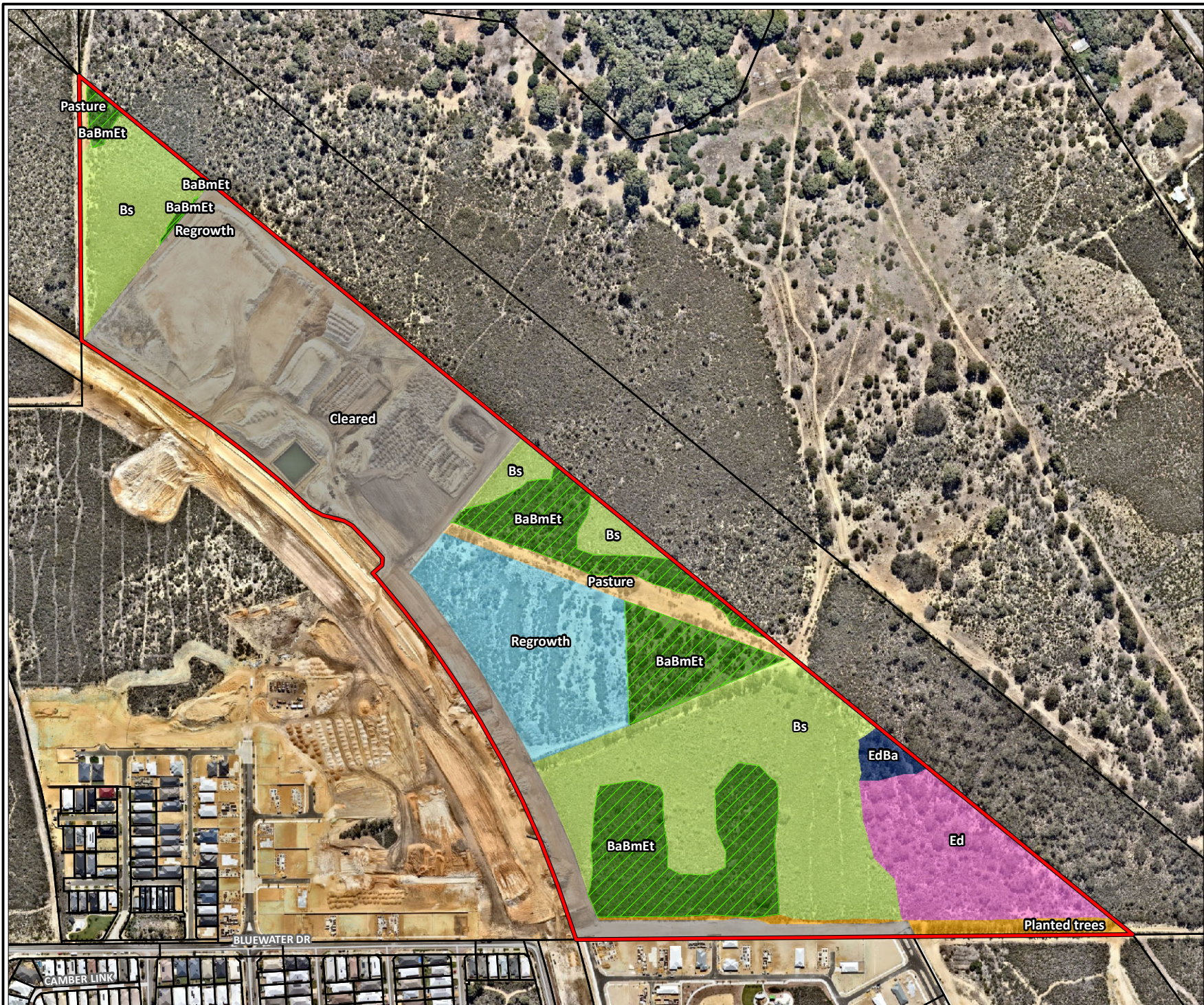


Coor. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

SURVEY AREA

FIGURE 7.7



Legend

- The site
- Cadastral boundary
- Banksia Woodlands of the Swan Coastal Plain TEC/PEC
- Vegetation types**
- BaBmEt
- Bs
- Ed
- EdBa
- Pasture
- Planted trees
- Regrowth
- Cleared
- Minor road
- Pedestrian way



Job No: 61075
 Client: Urban Quarter Pty Ltd
 Version: A Date 2/07/2021
 Drawn By: hsullivan Checked By: CT

Scale 1:6,000 at A4

 metres

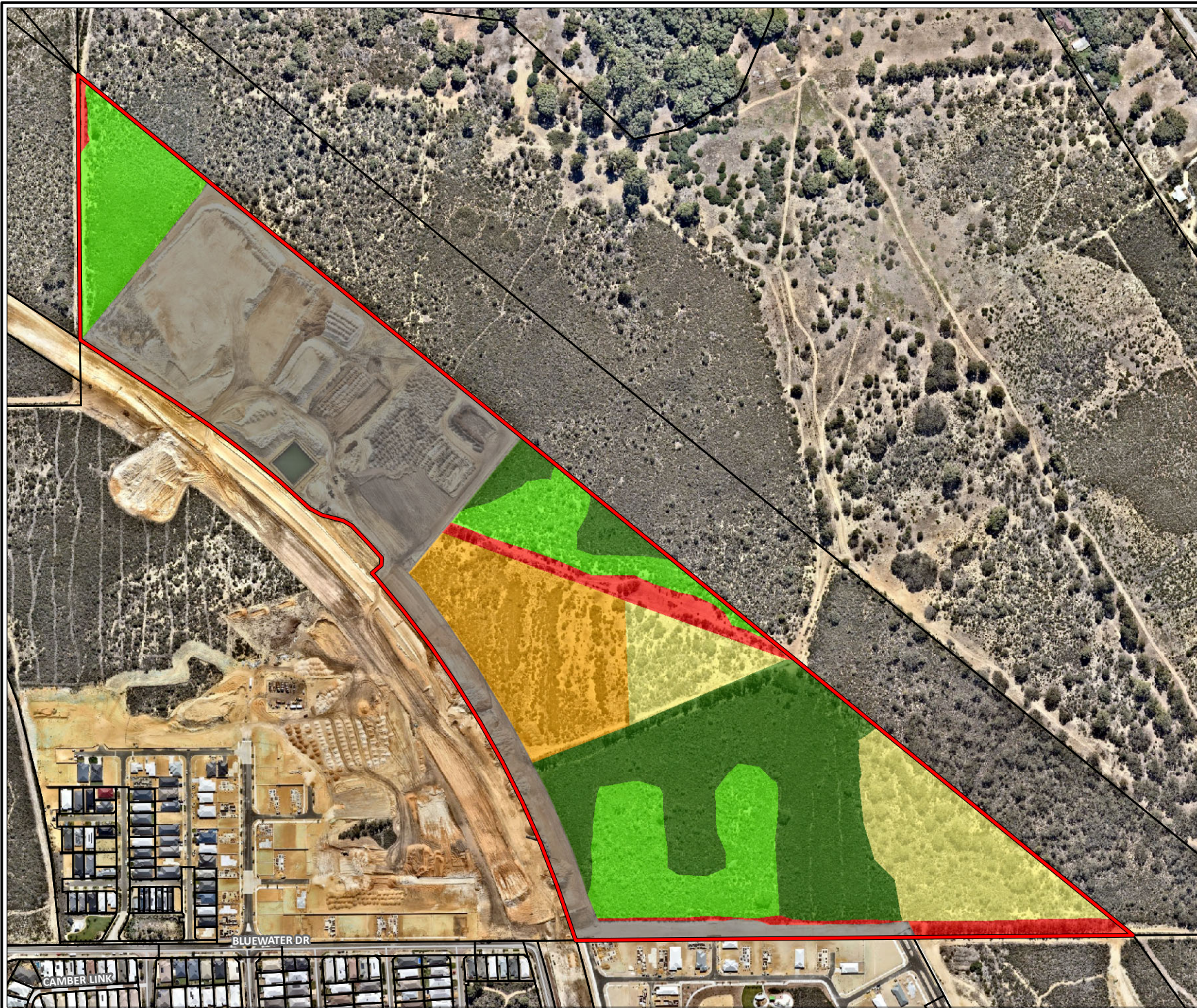
Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
 Lot 6 Taronga Place, Eglinton WA**

VEGETATION TYPES

FIGURE 7.8

File Name: W:\Projects\1)\OpenUrban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_8_VegTypes.mxd
 Image Reference: www.nearmap.com© - Imagery Date: 10 April 2021.



Legend

- The site
- Cadastral boundary
- Vegetation condition
- Excellent
- Very Good - Excellent
- Very Good
- Good - Degraded
- Completely Degraded
- Cleared
- Minor road
- Pedestrian way



Job No: 61075

Client: Urban Quarter Pty Ltd

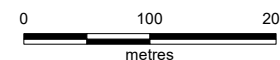
Version: A

Date 2/07/2021

Drawn By: hsullivan

Checked By: CT

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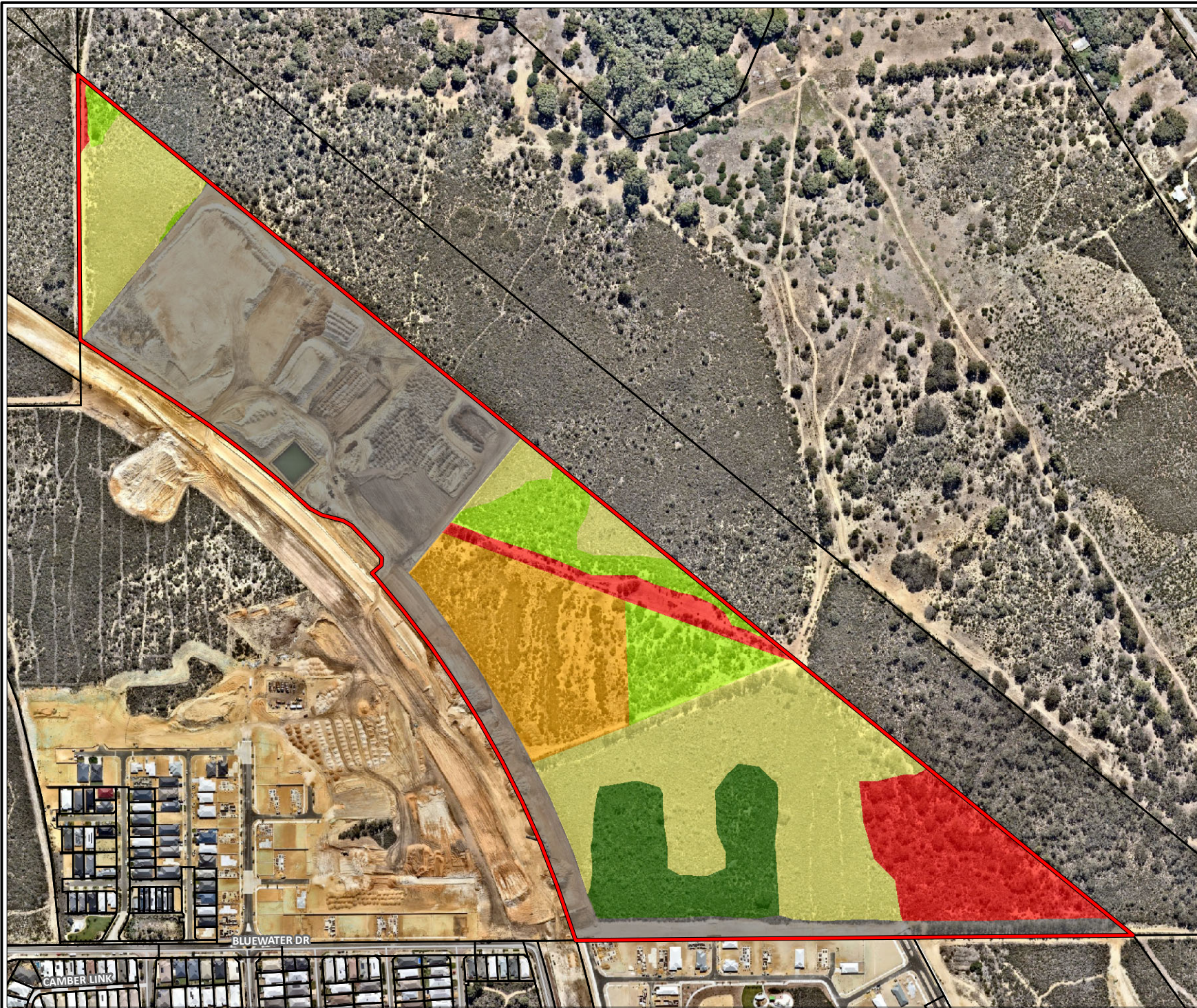


Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

VEGETATION CONDITION

FIGURE 7.9



- Legend**
- The site
 - Cadastral boundary
 - Black Cockatoo foraging habitat quality
 - Good
 - Moderate - Good
 - Moderate
 - Very Poor
 - Very Poor - Nil
 - Nil
 - Minor road
 - Pedestrian way



Job No: 61075

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Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

BLACK COCKATOO HABITAT

FIGURE 7.10



- Legend**
- The site
 - Bush Forever site
 - Regional ecological linkages
 - DBCA managed land
 - National Park
 - Highways
 - Main road
 - Minor road
 - Pedestrian way
 - Track



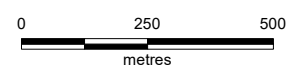
Job No: 61075

Client: Urban Quarter Pty Ltd

Version: A Date 2/07/2021

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Scale 1:15,000 at A4



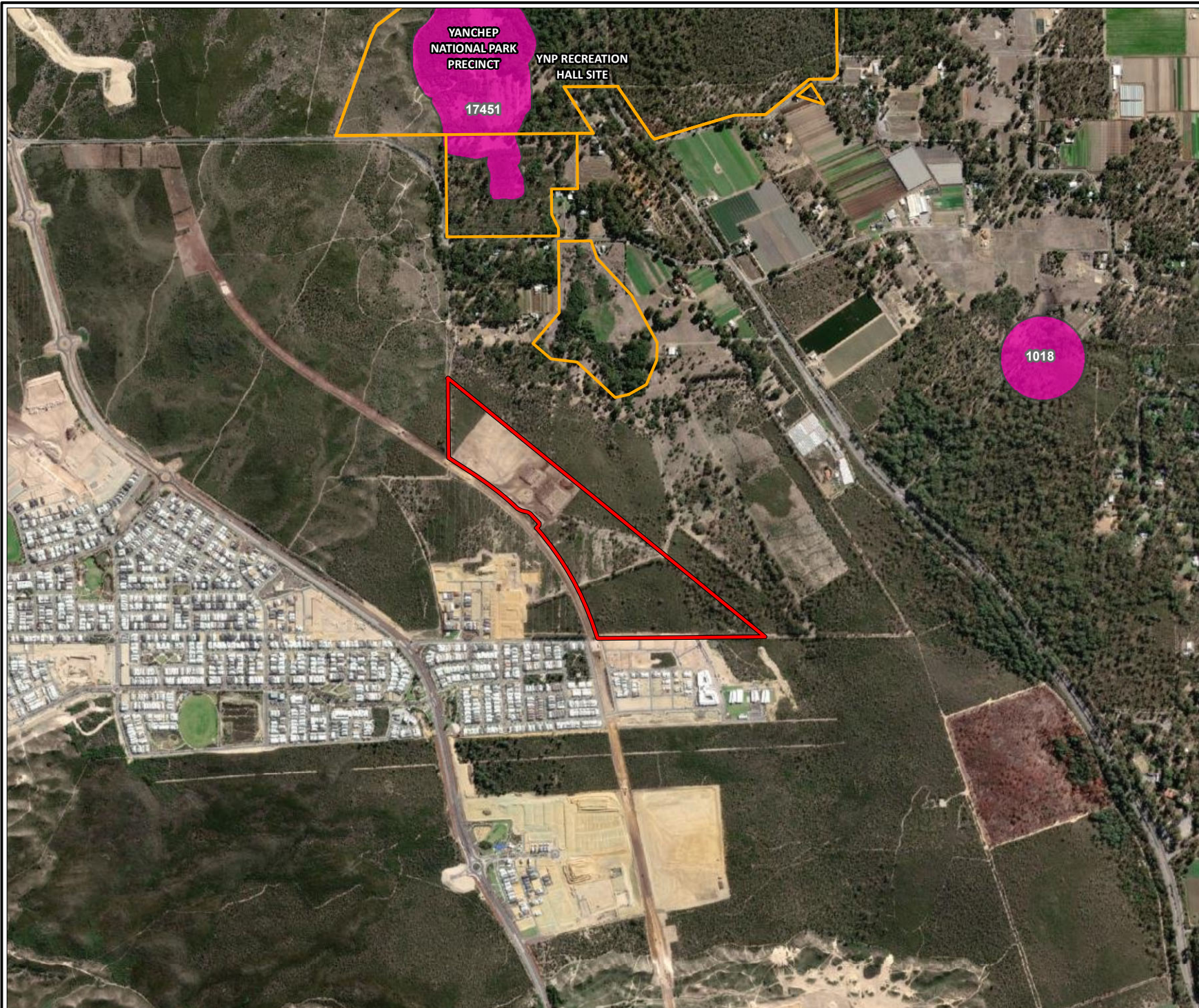
Coord. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

**CONSERVATION AREAS AND
ECOLOGICAL LINKAGES**

FIGURE 7.11

File Name: W:\Projects\11\OpenUrban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_11_ConsAreas.mxd
Image Reference: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



- Legend**
- The site
 - State heritage register
 - Registered site



Job No: 61075

Client: Urban Quarter Pty Ltd

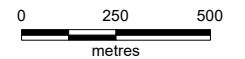
Version: A

Date 2/07/2021

Drawn By: hsullivan

Checked By: CT

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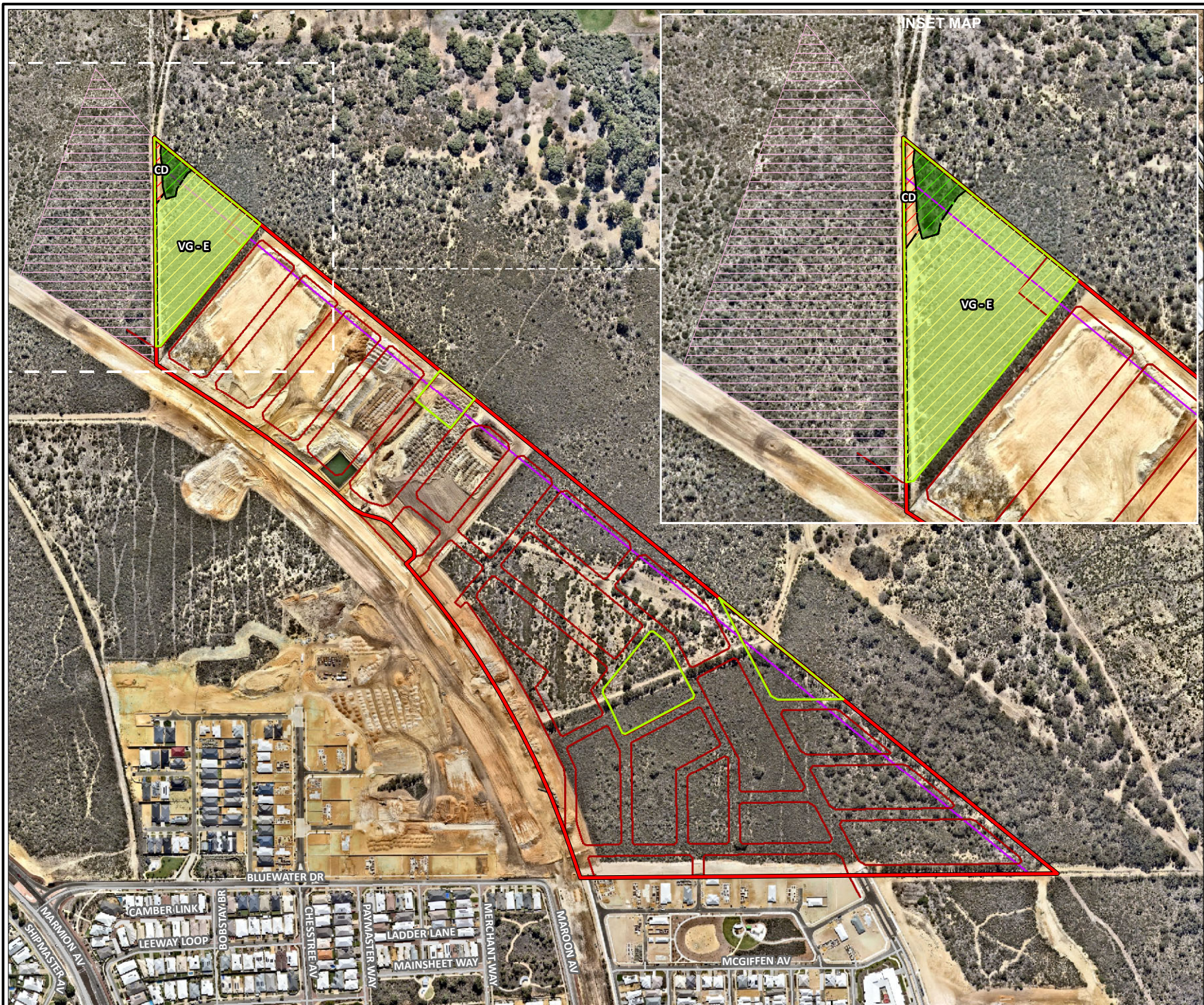


Coor. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

**CONSERVATION AREAS AND
ECOLOGICAL LINKAGES**

FIGURE 7.12



- Legend**
- The site
 - Public Open Space
 - Conservation area (managed by City of Wanneroo)
 - Change in vegetation condition
- Vegetation types
- BaBmEt
 - Bs
 - Pasture
- Black Cockatoo habitat quality
- Moderate - Good
 - Moderate
 - Very Poor - Nil
- Proposed development
 - Powerline easement
 - Highways
 - Main road
 - Minor road
 - Pedestrian way



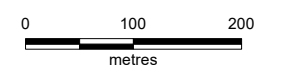
Job No: 61075

Client: Urban Quarter Pty Ltd

Version: A	Date 2/07/2021
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Drawn By: hsullivan	Checked By: CT
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Scale 1:7,000 at A4



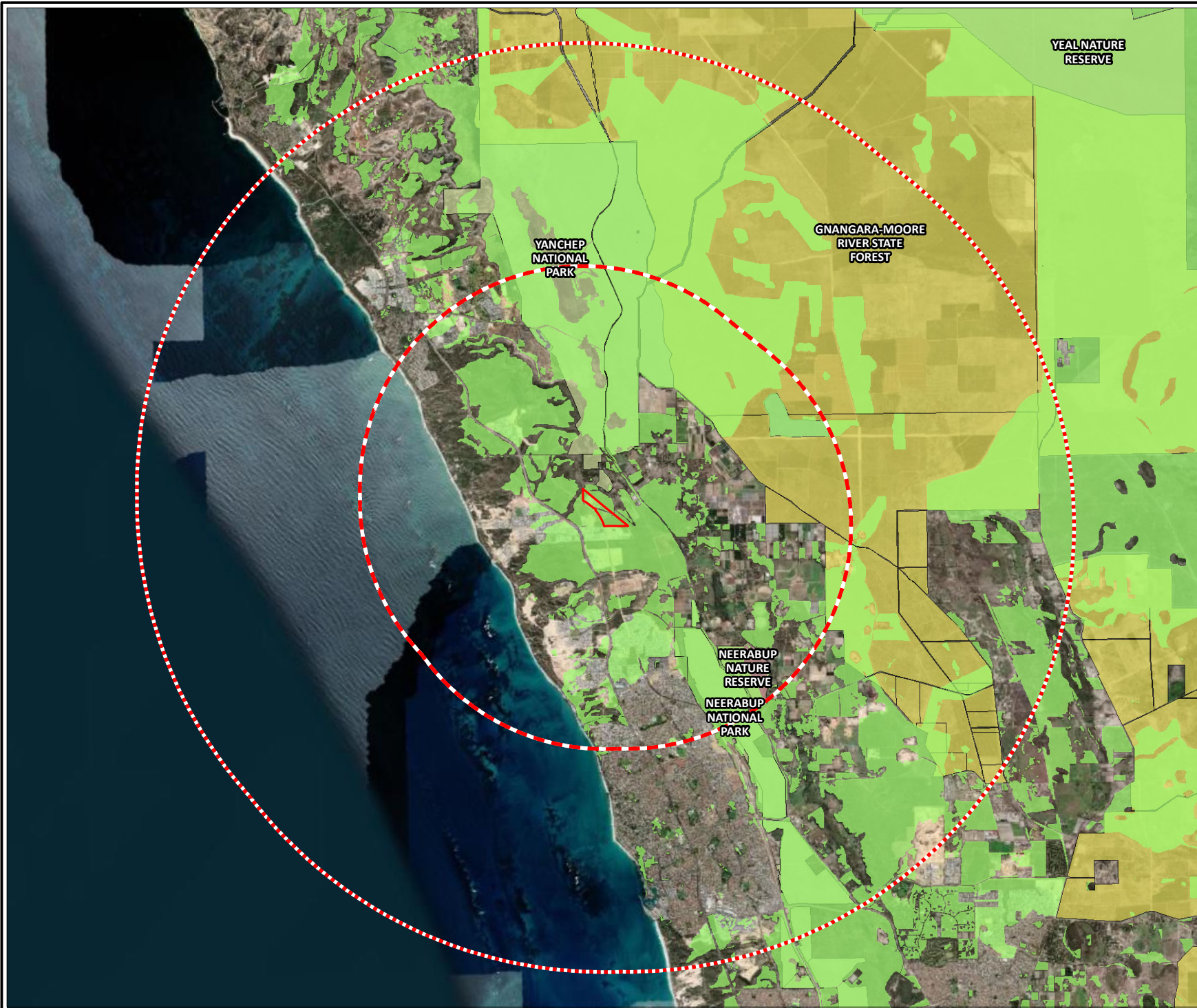
Coor. Sys. GDA2020 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

PROPOSED VEGETATION RETENTION

FIGURE 7.13

File Name: W:\Projects\1\Open\Urban Quarter\61075 East of the Beach Central Precinct EAR\GIS\Maps\R01_Rev_A\61075_07_13_PpsdConsArea.mxd
Image Reference: www.nearmap.com© - Imagery Date: 10 April 2021.



- Legend**
- The site
 - 6 km radius
 - 12 km radius
 - Potential Carnaby's Cockatoo foraging habitat
- Legislated lands and waters (DBCA)
- National Park
 - Section 5(1)(g) Reserve
 - Section 5(1)(h) Reserve
 - Nature Reserve
 - State Forest



Job No: 61075

Client: Urban Quarter Pty Ltd

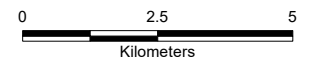
Version: A

Date 2/07/2021

Drawn By: hsullivan

Checked By: CT

Scale 1:140,000 at A4



Coor. Sys. GDA 1994 MGA Zone 50

**Central Precinct
Lot 6 Taronga Place, Eglinton WA**

**REGIONAL BLACK COCKATOO
HABITAT**

FIGURE 7.14

8. References

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Appendix A Local Structure Plan – Concept Plan (CLE 2021)

This plan has been prepared for general information purposes only and uses potentially uncontrolled data from external sources. CLE does not guarantee the accuracy of this plan and it should not be used for any detailed site design. This plan remains the property of CLE.

Consolidate Very Good - Excellent Vegetation Type with Adjacent Conservation Area

Sewer Pump Station Required in this Location

Managed Interface in Accordance with Bushfire Guidelines

Central POS
(Potential retention of existing trees within POS subject to detailed engineering design.)

Consolidated Drainage

MITCHELL FREEWAY RESERVE

POS
~2.04ha

POS
~0.31ha

POS
~0.65ha

POS
~0.95ha

Existing Conservation Area

North Shore Christian Grammar

Connection

Rail

Connection

Drainage Associated with Rail Corridor

Reserve

EAST OF THE BEACH ESTATE

SHOREHAVEN

Future Urban by Others

LEGEND

- Subject Site (35.48ha)
- Neighbourhood Connector

NDA - 21.1ha



**Appendix B EPBC Approval: Residential and Commercial Development on
Lot 6 Taronga Place, Eglinton, Western Australia (EPBC 2017/7872)**



Approval

Residential and Commercial Development on Lot 6 Taronga Place, Eglinton, Western Australia (EPBC 2017/7872)

This decision is made under sections 130(1) and 133 of the *Environment Protection and Biodiversity Conservation Act 1999*.

Proposed action

person to whom the approval is granted	Prime Eglinton Pty Ltd
proponent's ACN (if applicable)	ACN: 616 213 186
proposed action	To clear native vegetation to develop Lot 6, Taronga Place, Eglinton, Western Australia for residential and commercial land use [See EPBC Act Referral 2017/7872].

Approval decision

Controlling Provision	Decision
Listed threatened species and communities (sections 18 & 18A)	Approved

conditions of approval

This approval is subject to the conditions specified below.

expiry date of approval

This approval has effect until 31 December 2028.

Decision-maker

name and position	Gregory Manning Assistant Secretary Assessments (WA, SA, NT) and Post Approvals Branch
signature	
date of decision	18 September 2018

Conditions attached to the approval

1. The **approval holder** must not **clear** more than 92.25 hectares of **Carnaby's Black Cockatoo habitat** or 41.29 hectares of **Banksia Woodlands TEC** within the project area shown at Attachment 1.
2. Within 7 days prior to **clearing** of any area of **Carnaby's Black Cockatoo habitat**, the **approval holder** must investigate and document all potential nesting trees within the area to be **cleared** to determine if there are any hollows that are being utilised, or are capable of being utilised, by the **Carnaby's Black Cockatoos** for nesting. The investigation must be undertaken by a **suitably qualified person**.
 - a. If any **Carnaby's Black Cockatoo(s)** is detected utilising any hollow in any tree, the **approval holder** must:
 - i. clearly identify and mark the nesting tree
 - ii. maintain a register of nesting trees
 - iii. only clear the identified nesting tree and vegetation within a 10 metre radius of that tree, if a **suitably qualified person** has verified that the hollow in the tree is no longer being used by the **Carnaby's Black Cockatoo**.
 - b. For each **cleared** hollow that is being utilised, or capable of being utilised by the **Carnaby's Black Cockatoo**, the proponent must install at least three (3) artificial nesting hollows, where the artificial nesting hollows must be:
 - i. installed within a 12 km radius of the **cleared** nesting tree(s)
 - ii. constructed, positioned, erected and maintained in accordance with relevant **artificial hollow guidance**, to maximise the likelihood that the artificial nesting hollows are utilised by the **Carnaby's Black Cockatoo**
 - iii. installed before the commencement of the following **breeding season** for the **Carnaby's Black Cockatoo**
 - iv. inspected and maintained at least annually to check for condition and evidence of **Carnaby's Black Cockatoo** use.
3. To minimise impacts to the **Carnaby's Black Cockatoo** and the **Banksia Woodlands TEC**, the **approval holder** must, within 5 years of **commencement** of the action, provide the **Department** with written evidence that at least 8 hectares of **Carnaby's Black Cockatoo habitat** and **Banksia Woodlands TEC** has been transferred to the City of Wanneroo as **Public Open Space** for the purposes of conservation.
4. To mitigate impacts to the **Carnaby's Black Cockatoo** and the **Banksia Woodlands TEC**, the **approval holder** must prepare and submit a *Vegetation and Conservation Area Management Plan (VCAMP)* for the approval of the **Minister**. The **approval holder** must not **commence** the action unless the **Minister** has approved the VCAMP. The approved VCAMP must be implemented.

The VCAMP must be prepared in accordance with the **Department's Environmental Management Plan Guidelines** and include, but not be limited to:

- a. measures to prevent impacts to **Carnaby's Black Cockatoo habitat** and **Banksia Woodlands TEC** during construction, including to:
 - i. prevent and/or control site access, weeds, *Phytophthora* dieback, erosion, dust and fire
 - ii. delineate vegetation to be retained through, for example, the erection of temporary fencing or signage to avoid accidental **clearing** or disturbance outside of the impact area
 - b. objectives, targets and completion criteria for post construction rehabilitation measures such as site clean-up and weed management, including information on the mapping, monitoring and removal of noxious weeds
 - c. access control measures (e.g. fencing) to prevent or manage access to the areas of **Public Open Space** proposed to be retained for conservation
 - d. bushfire control measures
 - e. design and engineering controls to ensure that stormwater is not directed toward retained and adjacent areas of vegetation and that stormwater is appropriately managed to reduce hydrological impacts and prevent the mobilisation of dieback or other contaminants
 - f. clear objectives and performance indicators for all management actions, mitigation measures and practices prescribed by the VCAMP including details of the monitoring to be undertaken to demonstrate the effectiveness of the measures
 - g. corrective actions for circumstances where an action, mitigation measure or practice prescribed by the VCAMP fails to meet, or is unlikely to meet, its prescribed objective, and trigger action points at which these corrective actions will be implemented
 - h. timeframes for implementing the above measures.
5. To compensate for the loss of up to 92.25 hectares of **Carnaby's Black Cockatoo habitat** and 41.29 hectares of **Banksia Woodlands TEC** the **approval holder** must, within one year after the **commencement** of the action provide the **Department** with:
- a. written evidence that
 - i. 380 hectares of land at **Lot 5450 Wannamal Road West, Boonarring**
 - ii. 117 hectares of **Carnaby's Black Cockatoo habitat** and **Banksia Woodlands TEC** at **Lot 3333 Mimegarra Road, Cataby**
- have both been purchased and are being managed for conservation by the **DBCA**, using monies provided by the proponent for that purpose.

- b. the **offset attributes, shapefiles** and textual descriptions and maps to clearly define the location and boundaries of the **offset areas**, that the **approval holder** has transferred to the **DBCA**.
6. Within 30 days after the **commencement** of the action, the **approval holder** must advise the **Department** in writing of the actual date of **commencement**.
7. The **approval holder** must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the VCAMP required by this approval (Condition 4), and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the **EPBC Act**, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **Department's** website. The results of audits may also be published in the general media.
8. Within three months of every 12 month anniversary of the **commencement** of the action, the **approval holder** must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. Reports must remain on the website for the life of this approval. The **approval holder** must continue to comply with this condition until such time as agreed to in writing by the **Minister**.
9. Upon the direction of the **Minister**, the **approval holder** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.
10. The **approval holder** may choose to revise a management plan approved by the **Minister** under condition 4 without submitting it for approval under section 143A of the **EPBC Act**, if the taking of the action in accordance with the revised plan would not be likely to have a **new or increased impact**. If the **approval holder** makes this choice they must notify the **Department** in writing that the approved plan has been revised and provide the **Department**, at least four weeks before implementing the revised plan, with:
 - a. an electronic copy of the revised plan;
 - b. an explanation of the differences between the revised plan and the approved plan; and
 - c. the reasons the **approval holder** considers that taking the action in accordance with the revised plan would not be likely to have a **new or increased impact**.
11. The **approval holder** may revoke their choice under condition 10 at any time by notice to the **Department**. If the **approval holder** revokes the choice to implement a revised plan,

without approval under section 143A of the Act, the plan approved by the **Minister** must be implemented.

12. If the **Minister** gives a notice to the **approval holder** that the **Minister** is satisfied that the taking of the action in accordance with the revised plan would be likely to have a **new or increased impact**, then:
 - a. Condition 10 does not apply, or ceases to apply, in relation to the revised plan; and
 - b. The **approval holder** must implement the plan approved by the **Minister**.

To avoid any doubt, this condition does not affect any operation of conditions 10 and 11 in the period before the day the notice is given.

13. Conditions 10, 11 and 12 are not intended to limit the operation of section 143A of the **EPBC Act** which allows the **approval holder** to submit a revised plan to the **Minister** for approval.
14. Unless otherwise agreed to in writing by the **Minister**, the **approval holder** must publish all management plans referred to in these conditions of approval on their website for the duration of this approval. Each management plan must be published on the website within 1 month of being approved by the **Minister** or being submitted under condition 10 and must remain on the website for the life of this approval.

Definitions

- a. **Approval holder** means the name of the person to whom this approval is granted.
- b. **Artificial hollow guidance** means WA Department of Parks and Wildlife publications "*How to design and place artificial hollows for Carnaby's cockatoos*" (2015) and "*How to monitor and maintain artificial hollows for Carnaby's cockatoo*" (2015), or as otherwise updated from time to time.
- c. **Banksia Woodlands TEC** is the **EPBC Act** listed Banksia Woodlands of the Swan Coastal Plain ecological community
- d. **Breeding season** for the **Carnaby's Black Cockatoo** is the period between 1 July and 28 February of any year.
- e. **Carnaby's Black Cockatoo** is the **EPBC Act** listed Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*).
- f. **Carnaby's Black Cockatoo habitat** includes foraging, breeding, potential breeding and roosting habitat for **Carnaby's Black Cockatoo**, as defined in the *EPBC Act Referral Guidelines for three species of Western Australian black cockatoos: Carnaby's Black Cockatoo (Calyptorhynchus latirostris), (Endangered) Baudin's Black Cockatoo (Calyptorhynchus baudinii) (Vulnerable) and Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) (Vulnerable) (October 2012)*.
- g. **Clear, cleared or clearing** includes but is not limited to the cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning of vegetation (but not including weeds – see the *Australian weeds strategy 2017 to 2027* available from

[animals-and-weeds/review-aus-pest-animal-weed-strategy/aus-weeds-strategy](#) for further guidance).

- h. **Commence/Commencement of the action** is any works or actions (including but not limited to **clearing**, the use of construction or excavation equipment and any other site preparatory works) that will directly or indirectly impact on **Carnaby's Black Cockatoo habitat** and/or the **Banksia Woodlands TEC**, excluding any **clearing** done to support the Unexploded Ordinance Investigations provided this **clearing** only occurs in the area labeled 'Clearing Area' in Attachment 5 and does not exceed 2 ha of **Carnaby's Black Cockatoo habitat** and/or the **Banksia Woodlands TEC**.
- i. **Department** means the Commonwealth Department of Environment and Energy or any other agency that administers the **EPBC Act** from time to time and includes, where the context permits, the officers, delegates, employees and successors of the **Department**.
- j. **Department's Environmental Management Plan Guidelines** is the Environmental Management Plan Guidelines, Commonwealth of Australia 2014. Available at: <http://www.environment.gov.au/epbc/publications/environmental-management-plan-guidelines>.
- k. **EPBC Act** means the *Environment Protection and Biodiversity Conservation Act 1999* (Cth).
- l. **EPBC Environmental Offsets Policy** is the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (October 2012), or as updated from time to time. Available at: <http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy>.
- m. **Lot 5450 Wannamal Road West, Boonarring** means the 380 ha of land comprising 380 hectares of **Carnaby's Black Cockatoo habitat** and 165 hectares of **Banksia Woodlands TEC** as shown in Attachment 2.
- n. **Lot 3333 Mimegarra Road, Cataby** means the 117 ha of **Carnaby's Black Cockatoo habitat** and **Banksia Woodlands TEC** as shown in Attachment 3.
- o. **Minister** means the Minister administering the **EPBC Act** including any delegate of the Minister.
- p. **New or increased impact** means a new or increased environmental impact or risk relating to any protected matter, when compared to the likely impact under an Action management plan that has been approved by the **Minister** (as outlined in the *Guidance on 'New or Increased Impact' relating to changes to approved management plans under EPBC Act environmental approvals (2017)* available from <http://www.environment.gov.au/epbc/publications/new-increased-impact-guidance>).
- q. **Offset area** means the two offset sites at **Lot 5450 Wannamal Road West, Boonarring** and **Lot 3333 Mimegarra Road, Cataby**
- r. **Offset attributes** is an excel file ('.xls') capturing relevant attributes of the **offset area**, including the corresponding **EPBC Act** reference ID number, the physical address of the **offset area**, coordinates of the boundary points in decimal degrees, the **EPBC Act** protected matters that the **offset area** compensates, any additional **EPBC Act** protected matters which benefit from the **offset area**, the size of the **offset area** in hectares and the legal mechanism used to protect and conserve the **offset area**.

- s. **Public Open Space** are the areas of **Carnaby's Black Cockatoo habitat** and **Banksia Woodlands TEC**, totalling at least 8 hectares, which will be ceded to the City of Wanneroo for ongoing management. The vegetative condition of these areas must be at least Very-Good to Excellent as shown in Attachment 4.
- t. **Shapefile** is an ESRI shapefile containing '.shp', '.shx' and '.dbf' files and other files capturing attributes of the **offset area**, including the shape, **EPBC Act** reference ID number and **EPBC Act** protected matters present at the relevant site. Attributes should also be captured in '.xls' format.
- u. **Suitably qualified person** means a person who has professional qualifications and at least three years of relevant work experience surveying for the **Carnaby's Black Cockatoo** and who can give authoritative assessment, advice and analysis on performance relative to the subject matter using relevant protocols, standards, methods or literature. If the person does not have appropriate professional qualifications, the person must have at least five years of work experience related to the subject matter and can give an authoritative assessment, advice and analysis on performance relative to the subject matter using relevant protocols, standards, methods or literature.



Attachment 1: Project Area

Scale 1:9,000 at A4



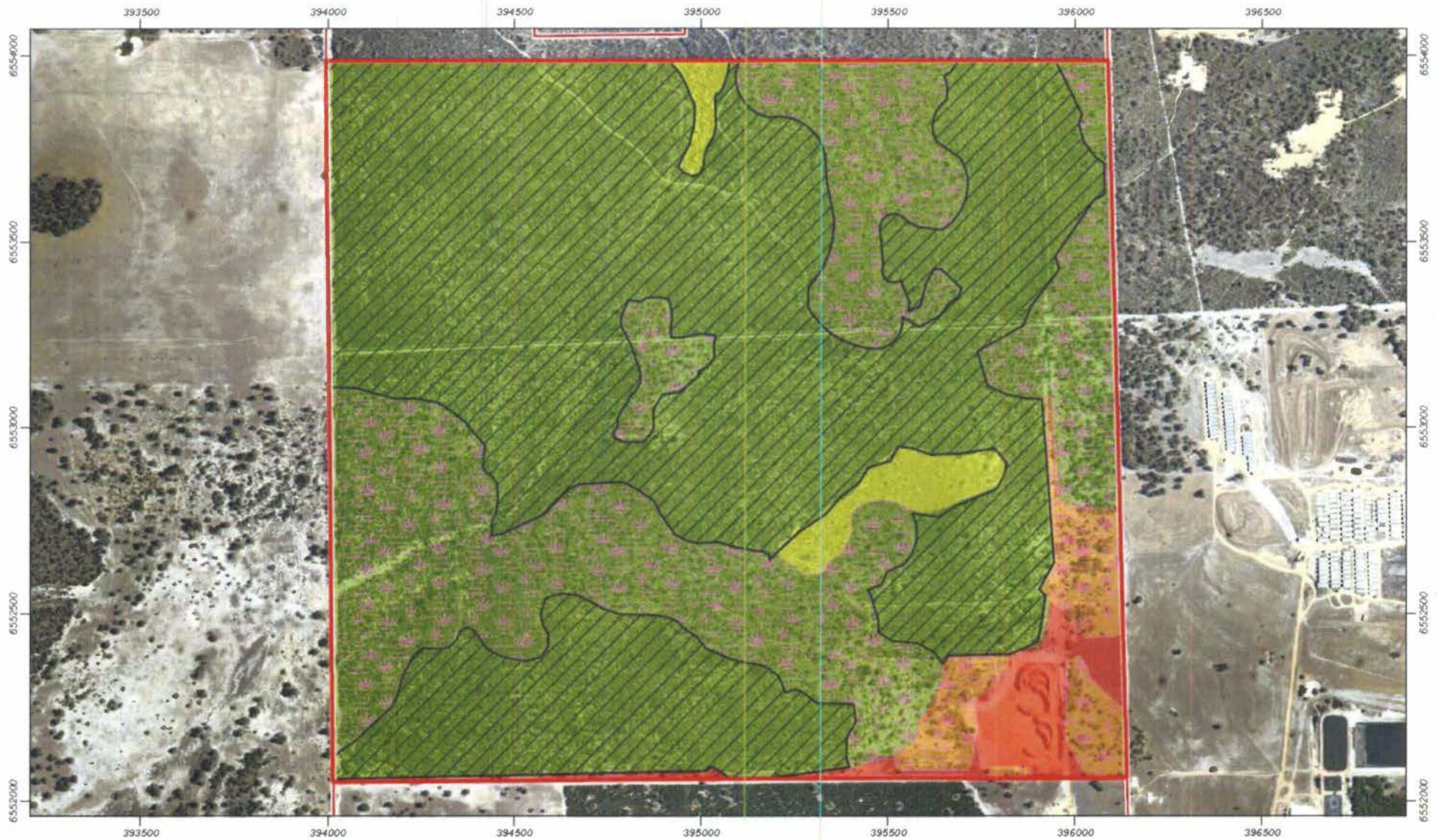
Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 23/08/2018
 Author: C.Thatcher
 Source: Aerial image: Neamap, flown 05/2018

Legend

- Proposed action area
- Freeway and Rail reserve
- Banksia TEC

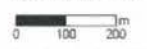
- Black cockatoo foraging habitat value**
- 3: Low to moderate foraging value
 - 4: Moderate foraging value

- 5: Moderate to high foraging value
- 6: High foraging value



Attachment 2: Lot 5450 Wannamal Road West, Boonarring

Scale 1:14,000 A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 23/06/2018
 Author: CThatcher
 Source: Aecom; Tree survey - January 2015; Banksia Woodlands - January 2015

Legend

- Offset site Lot 5450 (380 ha)
- Banksia Woodland
- Potential breeding/roosting trees

- Black Cockatoo foraging quality**
- 1
 - 2
 - 3
 - 5



Attachment 3: Lot 3333 Mimegarra Road, Cataby

Scale 1:17,500 at A4



Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas.
 Date: 23/08/2018
 Author: C Thatcher

Legend

-  Survey area
-  Offset area (117 ha)
-  Banksia woodland
-  Black cockatoo habitat

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community







170@strategen.com.au
 www.strategen.com.au





Attachment 4: Vegetation Condition of the Project Area

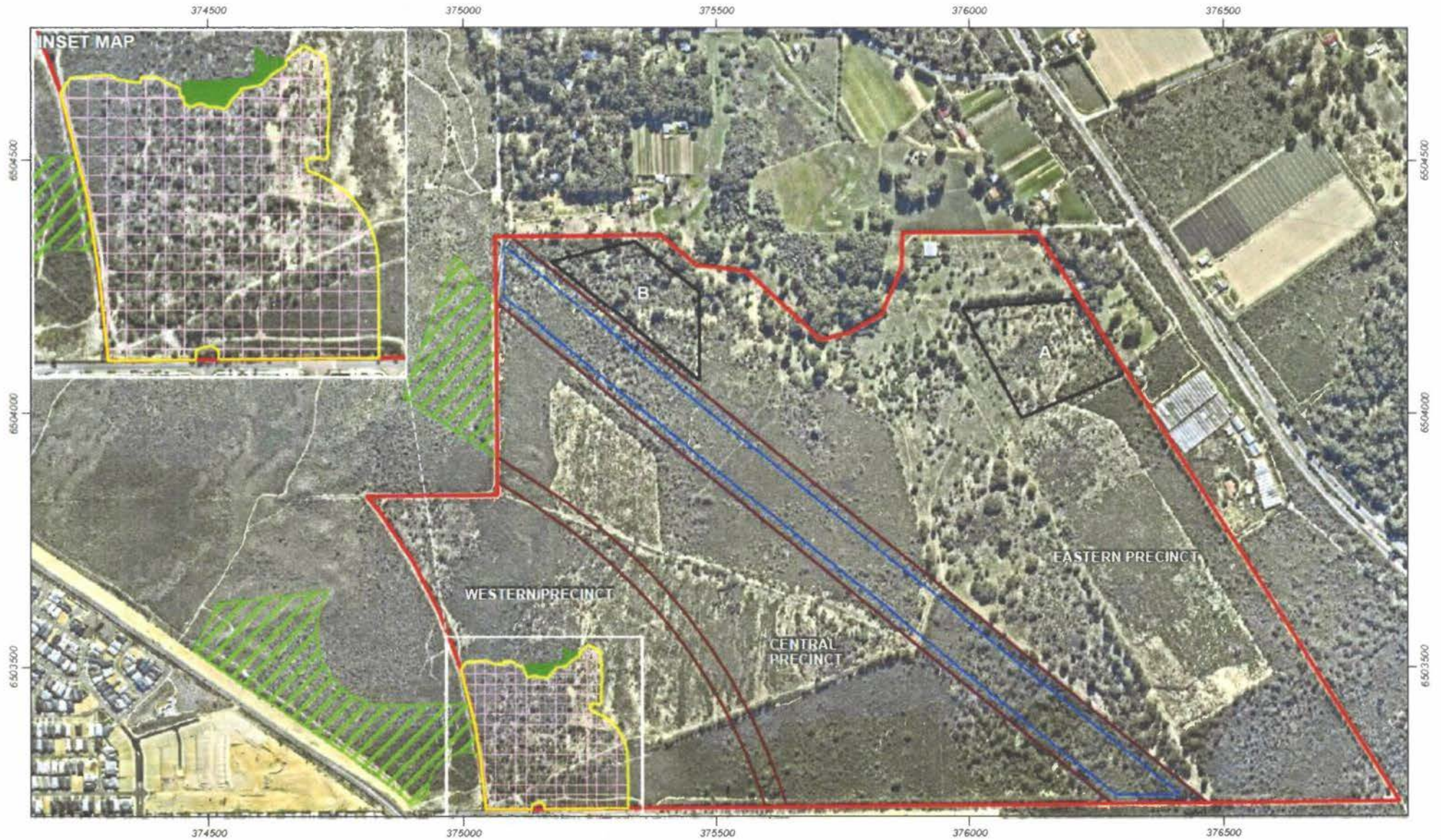
Scale 1:9,000 at A4
 0 100 200 m
 Coordinate System: GDA 1994 MGA Zone 50
 Note that positional errors may occur in some areas
 Date: 22/09/2018
 Author: CThatcher
 Source: Aerial image, Nearmap, flown 06/2018

Legend
 Proposed action area
 Freeway and Rail reserve

Vegetation condition
 Excellent (19.71 ha)
 Very Good - Excellent (39.90 ha)

 Very Good (19.64 ha)
 Good - Very Good (12.16 ha)
 Good - Degraded (33.14 ha)

 Degraded (1.68 ha)
 Completely Degraded (22.83 ha)



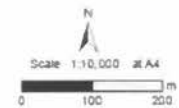
Attachment 5: Unexploded Ordnance Investigation Area

Legend

- Project Area
- Freeway and Rail Reserve
- Black Cockatoo Habitat & Banksia Woodland TEC retention areas (8ha)
- 20m Buffer
- 20m Grid
- POS area
- Clearing area
- Retained conservation areas

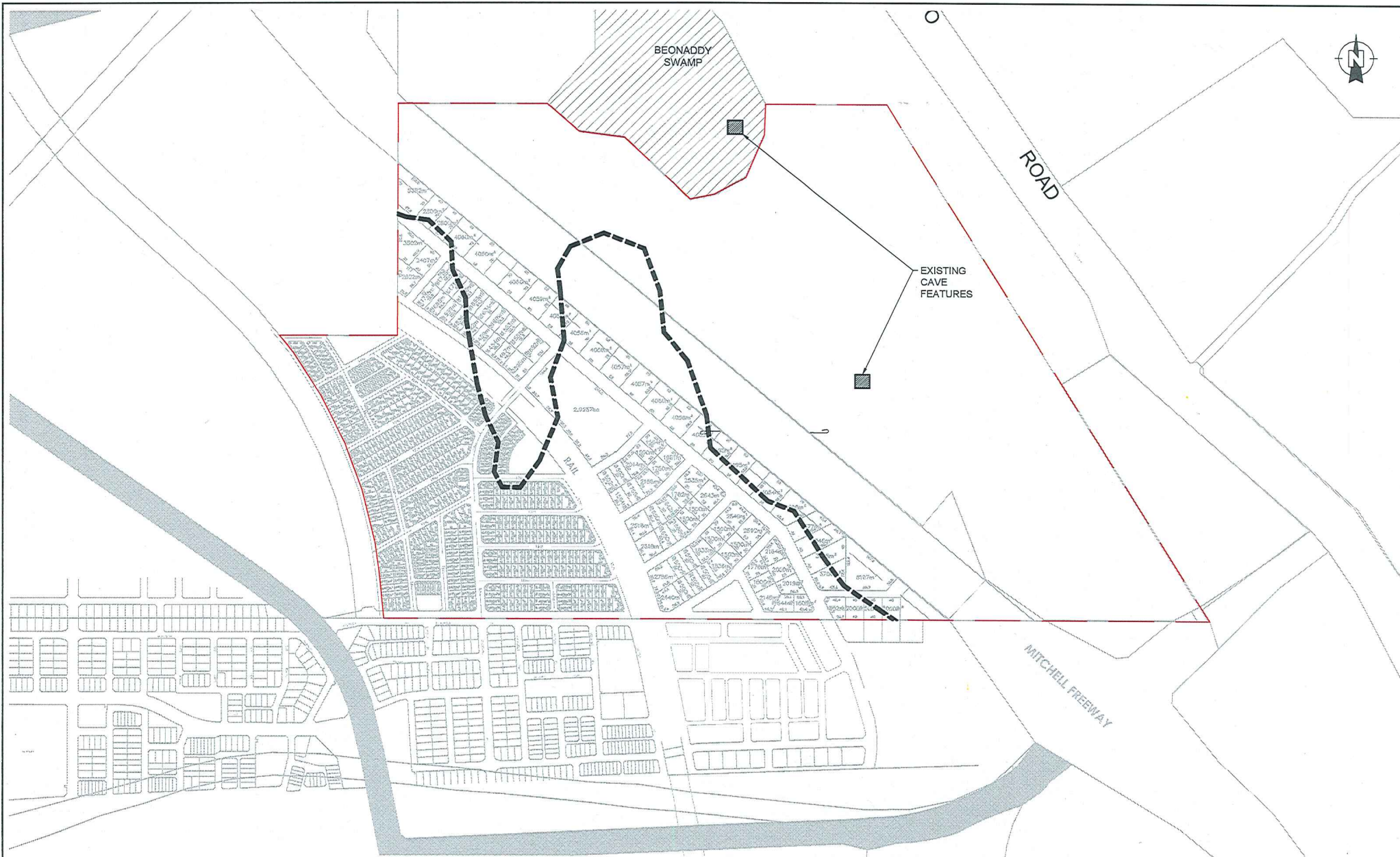


Vegetation and Conservation Area Management Plan
 Lot 6 Taronga Place, Eglinton
 EPBC 2017/7872



Coordinate System: GDA 1994 MGA Zone 50
 Date: 17.09.2018

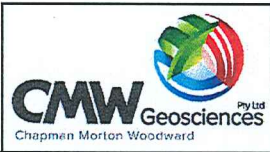
Appendix C Preliminary Karst Mapping (CMW 2016)



- LEGEND:**
- — — — — INFERRED WESTERN EDGE OF POTENTIAL KARST RISK ZONE
 - — — — — SITE BOUNDARY

NOTES:

1. BASE PLAN ADAPTED FROM: ROBERTS DAY CONCEPT PLAN, DRAWING NO. RD1 016, REV A, DATED 29.06.15



CLIENT:	QUBE PROPERTY GROUP PTY LTD	DRAWN:	DE	PROJECT:	PER2016-0407
PROJECT:	LOT 19 TARONGA PLACE, CARABOODA, WA	CHECKED:	PJM	FIGURE:	01
TITLE:	PRELIMINARY KARST RISK ASSESSMENT PLAN	REVISION:	0	SCALE:	1:7500
		DATE:	15/02/2016	SHEET:	A3 L


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