



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

PERMIT DETAILS

Area Permit Number: 8722/1
File Number: DWERTV3759
Duration of Permit: From 30 April 2020 to 29 April 2025

PERMIT HOLDER

City of Armadale

LAND ON WHICH CLEARING IS TO BE DONE

Road Reserve - 11358155, Haynes
Road Reserve - 12127256, Haynes
Road Reserve - 11857491, Armadale
Road Reserve - 12127234, Haynes
Road Reserve - 12256355, Haynes
Road Reserve - 11477678, Hilbert
Road Reserve - 12222449, Haynes
Road Reserve - 11857474, Armadale
Road Reserve - 11880603, Armadale
Road Reserve - 11880604, Brookdale
Lot 166 On Plan 16056, Hilbert
Lot 3636 On Plan 16056, Hilbert
Lot 8902 On Plan 69861, Hilbert

AUTHORISED ACTIVITY

The Permit Holder shall not clear more than 1.08 hectares of native vegetation within the area hatched yellow on the attached Plan 8722/1.

CONDITIONS

1. Avoid, minimise and reduce the impacts and extent of clearing

- (a) In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:
- I. avoid the clearing of native vegetation;
 - II. minimise the amount of native vegetation to be cleared; and
 - III. reduce the impact of clearing on any environmental value.

- (b) The Permit Holder must avoid and retain the seventeen habitat trees identified in the table below:

Easting	Northing	Tree #	Species
405235	6441496	3	<i>Corymbia calophylla</i>
405262	6441473	4	<i>Eucalyptus rudis</i>
405175	6441450	11	<i>Corymbia calophylla</i>
405284	6441476	13	<i>Eucalyptus rudis</i>
405401	6441522	22	<i>Eucalyptus rudis</i>
405411	6441523	27	<i>Eucalyptus rudis</i>
405400	6441518	56	<i>Eucalyptus rudis</i>

Eastings	Northing	Tree #	Species
405173	6441447	61	<i>Corymbia calophylla</i>
405185	6441447	67	<i>Corymbia calophylla</i>
405171	6441438	68	<i>Corymbia calophylla</i>
405771	6441535	69	<i>Corymbia calophylla</i>
405333	6441486	71	<i>Corymbia calophylla</i>
405361	6441494	72	<i>Eucalyptus rudis</i>
405324	6441485	73	<i>Eucalyptus rudis</i>
405310	6441540	75	<i>Eucalyptus ?wandoo</i>
405279	6441470	77	<i>Eucalyptus rudis</i>
405349	6441486	78	<i>Eucalyptus rudis</i>

2. Revegetation and rehabilitation

The Permit Holder must within 12 months of undertaking clearing authorised under this Permit:

- (a) undertake deliberate *planting* of at least twenty-six native tree species suitable for black cockatoo roosting, breeding or feeding habitat within the area cross-hatched red on attached Plan 8722/1b;
- (b) ensure at least eight *Eucalyptus rudis* (Flooded Gum) are planted;
- (c) ensure only *local provenance* propagating material is used;
- (d) ensure planting is undertaken at the *optimal time*;
- (e) ensure plantings are of a suitable size of at least one metre in height;
- (f) undertake weed control and watering of plantings for at least three years post planting;
- (g) the Permit Holder must within 24 months of planting the twenty-six appropriate native tree species in accordance with condition 2(a) of this Permit:
 - I. engage an *environmental specialist* to make a determination that the twenty-six native trees will survive.
 - II. If the determination made by the *environmental specialist* under condition 2(g)(i) that the twenty-six native trees will not survive, the Permit Holder must plant additional native trees that will result in twenty-six appropriate native trees persisting within the area cross hatched red on attached Plan 8722/1b.
- (h) where additional planting of native trees is undertaken in accordance with condition 2(g), the Permit Holder must repeat the activities required by conditions 2(b), 2(c), 2(d) and 2(e) of this Permit.

3. Dieback and Weed Control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

4. Record keeping

The Permit Holder must maintain the following records in relation to the clearing of native vegetation authorised under this Permit:

- (a) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
- (b) the date(s) that the area was cleared;
- (c) the size of the area cleared (in hectares);
- (d) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 1 (a) and condition 1 (b) of this Permit;
- (e) revegetation and rehabilitation activities undertaken in accordance with condition 2 of this Permit; and

- (f) actions taken to minimise the risk of the introduction and spread of *dieback* and *weeds* in accordance with condition 3 of this Permit.

5. Reporting

- (a) The Permit Holder must provide to the CEO, on or before 31 December of each calendar year, a report containing:
- I. The records required to be kept under condition 4; and
 - II. Records of activities done by the Permit Holder under this Permit between 1 July of the preceding calendar year and 30 June of the current calendar year.
- (b) If no clearing authorised under this permit has been undertaken, a written report confirming that no clearing under this Permit has been undertaken, must be provided to the CEO on or before 31 December of each calendar year.
- (c) The Permit Holder must provide to the CEO, no later than 90 calendar days prior to expiry date of the Permit, a written report of records required under condition 4, where these records have not already been provided under condition 5(a).

DEFINITIONS

The following meanings are given to terms used in this Permit:

CEO means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*

dieback means the effect of *Phytophthora* species on native vegetation;

environmental specialist means a person who holds a tertiary qualification in environmental science or equivalent, and has experience relevant to the type of environmental advice that an environmental specialist is required to provide under this Permit, or who is approved by the CEO as a suitable environmental specialist.

fill means material used to increase the ground level, or fill a hollow;

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

local provenance means native vegetation seeds and propagating material from natural sources within 10 and 50 kilometres and the same Interim Biogeographic Regionalisation for Australia (IBRA) subregion of the area cleared.

optimal time means the period from May to June for undertaking planting;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species;

weed/s means any plant -

- (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
- (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



Richard Newman
DIRECTOR
NATIVE VEGETATION PROTECTION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

30 April 2020

Plan 8722/1(a)

115°59'42.000"E

115°59'51.000"E

116°0'0.000"E

32°9'18.000"S

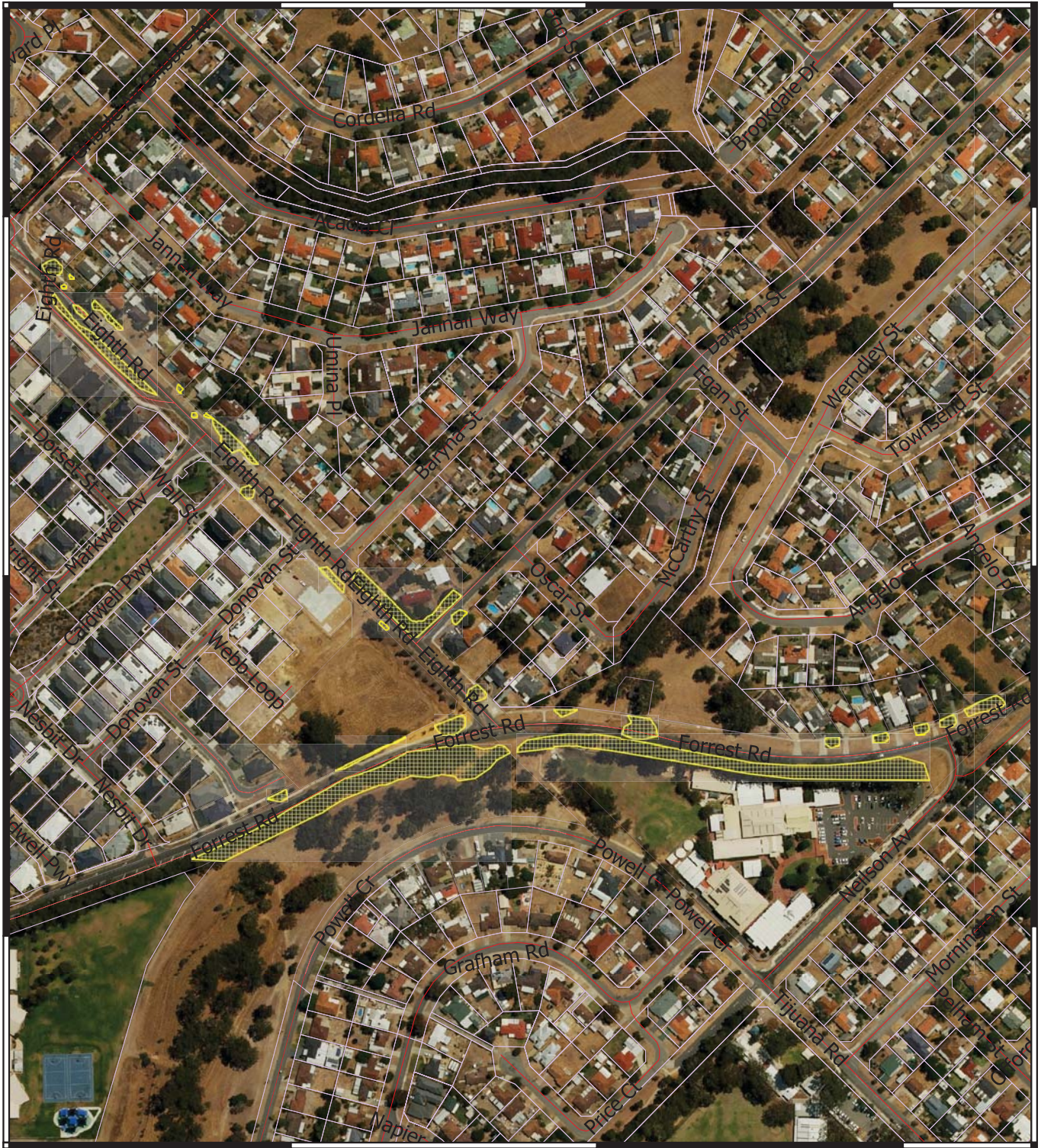
32°9'27.000"S

32°9'36.000"S

32°9'18.000"S

32°9'27.000"S

32°9'36.000"S




115°59'42.000"E

115°59'51.000"E

116°0'0.000"E


Legend

CPS layers

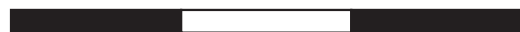
 CPS areas approved to clear

base layers

 Road Centrelines

 Cadastre - LGATE 218

0 100 200 300 m



Richard Newman
30/4/2020

Officer delegated under section 20 of the
Environmental Protection Act 1986




GOVERNMENT OF
WESTERN AUSTRALIA

Plan 8722/1(b)





Legend

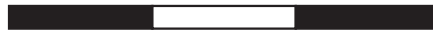
CPS layers

 CPS subject to conditions

base layers

 Road Centrelines
 Cadastre - LGATE 218

0 100 200 300 m




 Richard Newman
 30 April 2020

Officer delegated under section 20 of the
 Environmental Protection Act 1986



GOVERNMENT OF
 WESTERN AUSTRALIA



1. Application details

Permit application details

Permit application No.: 8722/1
Permit type: Area Permit

Applicant details

Applicant's name: City of Armadale
Application received date: 5 November 2019

Property details

Property:
ROAD RESERVE - 11358155, HAYNES
ROAD RESERVE - 12127256, HAYNES
ROAD RESERVE - 11857491, ARMADALE
ROAD RESERVE - 12127234, HAYNES
ROAD RESERVE - 12256355, HAYNES
ROAD RESERVE - 11477678, HILBERT
ROAD RESERVE - 12222449, HAYNES
ROAD RESERVE - 11857474, ARMADALE
ROAD RESERVE - 11880603, ARMADALE
ROAD RESERVE - 11880604, BROOKDALE
LOT 166 ON PLAN 16056, HILBERT
LOT 3636 ON PLAN 16056, HILBERT
LOT 8902 ON PLAN 69861, HILBERT

Local Government Authority: City of Armadale

Localities: Armadale

Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
1.08		Mechanical Removal	Road construction or upgrades

Decision on application

Decision on Permit Application: Grant

Decision Date: 30 April 2020

Reasons for Decision: The clearing permit application has been assessed against the clearing principles, planning instruments, and other matters in accordance with section 51O of the *Environmental Protection Act 1986*. It has been concluded that the proposed clearing may be at variance to clearing principles (b) and (f), and is not at variance with, or not likely to be at variance with, the remaining clearing principles.

The Delegated Officer had regard to the supporting documentation submitted by the applicant on the 28 February 2020 (City of Armadale, 2020). Through the assessment it was identified that the application area is completely degraded. However, 0.36 hectares of black cockatoo roosting habitat, and of moderate foraging value, will be impacted due to the widening of Forrest Road. Additionally, eight *Eucalyptus rudis* trees representative of riparian vegetation will be removed.

The Delegated Officer noted that to reduce impacts the applicant has avoided and retained mature trees wherever possible, and in particular along the southern section of Forrest Road that abuts Powell Reserve (R 52509). Among other measures the applicant will contribute to revitalising the adjacent Powell Reserve by planting black cockatoo foraging, roosting and breeding tree species at a rate of one native tree planted for each of the 26 native trees removed, thereby contributing to the enhancement of the adjacent Neerigen Brook South Main drain to a Living Stream. The Delegated Officer determined that the proposed clearing may increase the spread of weeds and dieback into adjacent vegetation.

The Delegated Officer determined that given the completely degraded condition of the vegetation present and the range of management and mitigation measures identified, the proposed clearing is unlikely to have any further significant environmental impacts, and is not likely to lead to an unacceptable risk to the environment.

The Delegated Officer decided to grant a clearing permit subject to retaining seventeen habitat trees, replanting native trees in the adjacent Powell Reserve at a rate of one to one, and dieback and weed management conditions.

2. Site Information

Clearing Description

1.08 hectares of clearing is required to facilitate upgrades to sections of Eighth Road and Forrest Road, Armadale, for a road, cycle and pedestrian path, and a median island. The 1.08 hectares is of Parkland Cleared vegetation, consisting of local native trees and planted non-native trees, over introduced grasses or garden beds.

Vegetation Description

The vegetation within the application area is mapped as the following:

Beard vegetation association:

- Pinjarra 968.3 Medium woodland; jarrah, marri and wandoo.

Swan Coastal Plain vegetation complex:

- North-West (Eighth Road and Forrest Road west) is:
Guildford Complex (32): Open Forest to Tall Open Forest and Woodland:
A mixture of open forest to tall open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah) and woodland of *Eucalyptus wandoo* (Wandoo) (with rare occurrences of *Eucalyptus lane-poolei* (Salmon White Gum). Minor components include *Eucalyptus rudis* (Flooded Gum) - *Melaleuca rhapsiophylla* (Swamp Paperbark).
- South-East (Forrest Road east) is:
Forrestfield Complex (29): Open Forest And Fringing Woodland
Vegetation ranges from open forest of *Corymbia calophylla* (Marri) - *Eucalyptus wandoo* (Wandoo) - *Eucalyptus marginata* (Jarrah) to open forest of *Eucalyptus marginata* (Jarrah) - *Corymbia calophylla* (Marri) - *Allocasuarina fraseriana* (Sheoak) - Banksia species. Fringing woodland of *Eucalyptus rudis* (Flooded Gum) in the gullies that dissect this landform.

Local Description

- Native vegetation within the application area is parkland cleared, and consists of native eucalypt tree species over introduced grasses and garden beds alongside roads. Native tree species present are an admixture of: *Corymbia calophylla* (Marri), *Eucalyptus rudis* (Flooded Gum), and *Eucalyptus ?wandoo* (Wandoo).

Vegetation Condition

Vegetation across the application area is parkland cleared, and therefore Completely Degraded based on the condition scale of Keighery (1994).

Soil and Landform Type:

Three separate soil descriptions have been mapped over the application area:

- Forrest Road east consists of the EnvGeol Cs Phase:
Sandy Clay – white/grey to brown, fine to coarse-grained, subangular to rounded sand, clay of moderate plasticity gravel and silt layers near scarp.
- Forrest Road west consists of the Pinjarra P3 Phase:
Flat to very gently undulating plain with deep, imperfect to poorly drained acidic gradational yellow or grey-brown earths, and mottled yellow duplex soils, with loam to clay loam surface horizons.
- Eighth Road consists of Bassendean B2 Phase:
Flat to very gently undulating sandplain with well to moderately well-drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan one to two metres.

Comments:

The applicant is the City of Armadale. The local area referred to in the assessment of this application is defined as a 10 kilometre radius measured from the perimeter of the application area. The application area is located within the Swan Coastal Plain (SWA02) bioregion as described by Thackway and Cresswell (1995), with the Jarrah Forest bioregion (JAF01) just 1.5 kilometres to the east. The local area contains approximately 33.6 per cent native vegetation cover.



Figure 1: Representative photographs of the application area (Paperbark Technologies 2019)

3. Avoidance and minimisation measures

Both Forrest Road and Eighth Road have been identified and approved as key strategic routes within the Wungong Urban Water Redevelopment Scheme (WUW), managed by the State Government's Development WA (formerly the Metropolitan Redevelopment Authority). The WUW Project requires the proposed upgrade to support the increase in traffic volumes generated by additional population and commerce. The applicant considered three alternatives prior to the selection of the current option (City of Armadale 2020).

1) **Retaining the current road alignment and road width (Forrest Road)**

The current road alignment and width is sufficient for a dual lane two way road only, with no median strip. Traffic modelling to identify future traffic volumes indicated that the current road width and form is unsuitable. Dual lanes in each direction are required to cater for expected traffic volumes on Forrest Road. The upgrade is also a key component of the City of Armadale (the City) Strategic Community Plan objective 3.3.2: *'provide key links between Armadale Centre and future neighbourhood centres'*. The City concluded that there is no option to retain Forrest Road single lane in each direction.

2) **Reduce the proposed road width (Forrest Road)**

Elements including bike lanes, footpaths, and medians add width to the road corridor and were considered for removal, thereby reducing impacts to roadside vegetation. The provision of both footpaths and a dedicated bike lane aligns with the Development WA network movement scheme objective 2.3.4 Connectivity: *'To enhance connectivity and reduce the need to travel by car, supporting development aimed at well-designed places that support walking, cycling and public transport...'* The central median is considered necessary to provide protection for turning vehicles by way of dedicated turning lanes. The central median also provides for separation of vehicles to reduce vehicle collisions, and provides pedestrians with the ability to stage their road crossing. This is particularly important for children, the elderly and pedestrians with disabilities. The City concluded that the central median is an important feature of the road upgrade.

3) **Avoidance of vegetation – Forrest Road**

The City explored options to retain any trees possible, including taking of land on the north side of Forrest Road. This option would have avoided the removal of vegetation from Neilson to Eighth Road. The City assessed the land requirements, and concluded that many properties would need to be demolished to affect this solution.

Avoidance, management and mitigation measures for the proposed clearing have been considered in line with the City's environmental objectives and strategic goals (City of Armadale 2020).

Avoidance and management

Site offices, access tracks, temporary storage and laydown areas will utilise existing cleared areas to reduce impacts to native vegetation. A Construction Environmental Management Plan and Dust Management Plan will be prepared and implemented during clearing activities.

Rather than proposing to clear the entire Development Envelope (larger than the application area considered here), the applicant engaged an arborist (Paperbark Technologies 2019) to identify trees that could be avoided, and therefore retained, despite the proposed works.

Results of this work concluded that of forty-four native 'habitat trees' within the application area, seventeen have been identified for avoidance and retention.

Trees identified for retention will be protected in accordance with Australian Standard (AS) 4970-2009 Protection of trees on development sites. As per AS 4970-2009 the tree protection zone (TPZ, a combination of the root area and crown area), is the principal means of protecting trees. The TPZ of trees identified for retention will be isolated from construction disturbance using temporary fencing, so that the tree remains viable (City of Armadale 2020).

Mitigation

The application area includes a small component of Powell Reserve (R 52509). Powell Reserve is managed by the City of Armadale, is located immediately adjacent to the application area, and extends for 7.2 hectares to the south-west incorporating the Neerigen Brook South Main drain. A portion of Powell Reserve is a known black cockatoo roosting site. To mitigate any impacts of the proposed clearing the following strategies are proposed by the applicant (City of Armadale 2020):

- Mature trees over the application area have been identified by Paperbark Technologies (2019). Identified mature trees that are removed, regardless of whether they are native or not, will be replaced by planting black cockatoo foraging and breeding tree species, utilising species occurring in the local area (including Marri), within the adjacent Powell Reserve (R 52509) at a rate of two native trees planted for each tree removed. This includes at least 40 mature trees (26 of which are native) assessed by Focussed Vision (2019). The planted trees will be monitored and watered as required for up to two summers post planting. Replacement planting will be undertaken as required to supplement any losses within the two year maintenance period.
- Of the native trees proposed to be removed none provide hollows suitable for black cockatoo breeding (Focused Vision 2020; Insight Ornithology 2020). Nevertheless, it is possible that eight of the native trees proposed to be removed may contain hollows of some description. Prior to removal of these trees each potential hollow will be assessed by the City of Armadale's Parks team, and if considered viable will be salvaged and installed within City of Armadale reserves. This is a practice that is regularly undertaken by the City of Armadale. For any hollows that cannot be salvaged, the City will install an equivalent number of additional 'Cockatubes' in Bungendore Park (within the Wungong Regional Park), and incorporate them into the City's Cockatube monitoring program.
- Black cockatoo foraging material, such as branches and nuts of Marri trees that are removed, will be salvaged to provide a valuable food source for rescued black cockatoos at Kaarakin Black Cockatoo Conservation Centre.
- The City of Armadale will seek to amend the purpose of the vesting for the section of Powell Reserve (R 52509) that is a known Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) from 'Public Recreation and Drainage' to 'Public Recreation, Drainage and Black Cockatoo Habitat Preservation'.

4. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

The application area is parkland cleared with no native understorey species present.

No Threatened or Priority flora taxa have been recorded within the application area. According to available databases, 12 Threatened flora taxa and 40 priority flora taxa have been recorded within the local area of a 10 kilometre radius of the application area. The closest Threatened flora was recorded 1.3 kilometres to the south-west of the application area (*Diuris purdei*) (Endangered), and the closest Priority flora taxa was recorded 870 metres north-east of the application area; *Calytrix simplex* subsp. *simplex* (P1) and *Acacia horridula* (P3). Due to the Completely Degraded condition of the vegetation, with a lack of native understorey, no Threatened or Priority flora taxa are likely to occur.

No Threatened Ecological Communities (TECs) listed under the *Biodiversity Conservation Act 2016* or *Environment Protection and Biodiversity Conservation Act 1999*, or Priority Ecological Communities, have been mapped or identified over the application area. The closest to the application area is the Endangered *Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region* located further than 1.5 kilometres to the east. Vegetation over the application area is not representative of any recognised TECs or PECs, and given the Completely Degraded condition are unlikely to occur.

Vegetation present offers potential night roosting habitat and foraging habitat to Threatened black cockatoo species. However, the application area is unlikely to support high levels of species diversity, ecosystem diversity or genetic diversity due to its Completely Degraded condition with a lack of understorey, lack of priority species, and the significant areas of native vegetation in better condition elsewhere within the local area.

The proposed clearing is not at variance with Principle (a).

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.

According to available databases forty-four vertebrate fauna species of conservation significance have been recorded within the local area of a 10 kilometre radius of the application area, including nine mammals, four reptiles, and 31 birds. Of these one species, the Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*), has been recorded within the application area.

Other species recorded include 25 shorebirds and waterbirds protected under International Agreements including Priority and Threatened species (particularly the Families: Scolopacidae, Charadriidae, and Glareolidae) (DBCAs 2007-). These species are unlikely to occur in the application area due to it lacking wetland habitat. The migratory Fork-tailed Swift (*Apus pacificus*), as well

as the Peregrine Falcon (*Falco peregrinus*) (other specially protected fauna) may overfly the application area without utilising any of the habitats present.

None of the reptiles or mammals identified are likely to occur due to the Completely Degraded condition and in particular, a lack of understorey. The Endangered Western False Pipistrelle (*Falsistrellus mackenziei*) (a bat) may potentially overfly the application area, however, its range has contracted to old growth forest and higher rainfall eucalypt woodlands (Richards *et al.*, 2012), and it is unlikely to be present.

Of the vertebrate fauna species of conservation significance identified, the species most likely to occur over the application area are the three vagile species of black cockatoo known from the Perth metropolitan area that could utilise the tree canopy present. The Endangered Carnaby's Cockatoo (*Calyptorhynchus latirostris*), Endangered Baudin's Cockatoo (*Calyptorhynchus baudinii*), and the Vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) are all known from the vicinity of the application area.

Black cockatoo habitat can be considered in terms of breeding habitat, night roosting habitat, and foraging habitat. Black cockatoos will generally forage up to 12 kilometres from an active breeding site (DSEWPaC 2012) (DoEE 2017) (DPaW 2013). Following breeding, they will flock in search of food, usually within six kilometres of a night roost (DSEWPaC 2012; DoEE 2017; DPaW 2013), but may range up to 20 kilometres (Commonwealth of Australia 2017). Food resources within the range of breeding sites and roost sites are important to sustain populations, and foraging resources are therefore viewed in the context of known breeding and night roosting sites, particularly within 12 kilometres of an impact area (Commonwealth of Australia 2017).

Black cockatoo night roosts are usually located in the tallest trees of an area, and in close proximity to both a food supply and surface water (DAWE 2020a). Flocks will use different night roosts, often for weeks, or until the local food supply is exhausted. Flocks show some fidelity to night roosts with sites used in most years to access high-quality feeding sites. However, not all night roosts are used in every year (DPaW 2013).

Over 1,800 records of Carnaby's Cockatoo have been made within the local area, including within the application area itself. Large aggregations occur approximately 5.5 kilometres to the north-west, and 5.5 kilometres to the south-east, with seven confirmed night roosts within the local area, the closest being approximately 3.5 kilometres to the north. The application area is also located on the edge of a confirmed Carnaby's Cockatoo breeding area, centred approximately 10 kilometres north-east.

Baudin's Cockatoo is commonly associated with jarrah-marri forest of the Jarrah Forest bioregion approximately 1.5 kilometres to the east. The species is known from the local area with over 235 records, the closest of which is approximately 2.5 kilometres to the north-east. Large aggregations occur approximately four kilometres to the north-east along the Canning River, and 6.5 kilometres to the south-east along Wungong Creek at the base of Wungong Dam. The application area is within the known foraging area for Baudin's Cockatoo and chewed Marri nuts (a favoured food item) were noted in the application area by Focused Vision (2020).

Over 90 records of the Forest Red-tailed Black Cockatoo have been made within the local area including immediately adjacent to the application area, where a known night roost is located within Powell Reserve approximately 125 metres to the south-west. Chewed Marri nuts (a favoured food item) were noted in the application area by Focused Vision (2020).

Native vegetation within the application area consists of trees within the road verge consisting of three species; *Corymbia calophylla* (Marri), *Eucalyptus wandoo* (Wandoo), and *Eucalyptus rudis* (Flooded Gum). A black cockatoo habitat assessment was undertaken over the application area to determine the specific black cockatoo habitat potential present (that is, breeding habitat, night roosting habitat, and foraging habitat) (Focused Vision 2019; Focused Vision 2020). A qualified arborist has also assessed and documented each individual tree, including non-native trees, within the application area (Paperbark Technologies 2019). Breeding habitat results obtained by Focused Vision (2020) (that is, potential tree hollows) were subsequently refined with a physical hollow inspection by Insight Ornithology (2020) of each of the 11 higher-ranked tree hollows (that is, those ranked '3' or higher recorded by Focused Vision 2020).

Approximately 0.78 hectares black cockatoo roosting habitat occurs over the application area, along the Forrest Road section only. The western section of Forrest Road comprises native species (0.39 hectares), predominantly on the southern side, with the eastern section comprising non-native species (Focused Vision 2020; Paperbark Technologies 2019). A known Forest Red-tailed Black Cockatoo night roost is located approximately 150 metres to the south in the adjacent Powell Reserve which was known to be active in 2016 and 2018 (City of Armadale 2020). Black cockatoos can roost in any suitable trees within 500 metres of roosts, and can use different trees within the one roost area on different nights (DBCA 2020). It is conceivable, therefore, that the taller trees within the application area south of Forrest Road, contiguous with the known roost, may be used for night roosting by the Forest Red-tailed Black Cockatoo.

Foraging habitat was assessed for the three individual species of black cockatoo, and based on the data from the black cockatoo habitat assessment of Focused Vision (2020) 0.36 hectares of 'Moderate' foraging habitat for Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo occurs within the application area, predominantly along the southern side of Forrest Road west and within 150 metres of the known Red-tailed Black Cockatoo night roost at Powell Reserve. A 'Moderate' ranking equates to '4' on a scale from '1' (low) to '6' (high) (Focused Vision 2020). The 0.36 hectare foraging habitat area corresponds to 'Low to Moderate' ('3') foraging habitat for Baudin's Cockatoo. The application area is within two kilometres of large tracts of jarrah marri forest associated with the Jarrah Forest bioregion to the east particularly suitable for Baudin's and Forest Red-tailed Black Cockatoo, and approximately three kilometres from areas of Swan Coastal Plain vegetation at Forrestdale Lake and Jandakot Regional Park suitable for Carnaby's Cockatoo, and over 33 percent of remnant vegetation is retained within a 10 kilometre radius of the application area. However, negligible vegetation remains within a one kilometre radius, and just 2.4 percent within a two kilometre radius of the application area. A loss of a small area of Moderate quality food resource may therefore have a relatively more significant impact on the ability for birds to remain in the immediate vicinity of the application area.

Focused Vision (2020) assessed all native trees over the application area for black cockatoo breeding potential. Twenty-six trees identified for removal within the application area were recorded with a diameter at breast height greater than 500 millimetres (or 300 millimetres for Wandoo); 15 Marri, 8 Flooded Gum and three Wandoo. Rankings of potential hollows were assigned for each tree; with '1' being the highest value, and '5' the lowest (Focused Vision 2020). Of the 26 trees, eight initially recorded a rank of '3' or higher; that is, 'Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present'. Of these, one Marri recorded a value of '2'; that is, 'Hollow of suitable size and angle (i.e. near vertical) visible with chew marks around entrance'. The hollow inspection of Insight Ornithology (2020), however, inspected all these hollows and concluded that none of the trees contained active black cockatoo nests, nor did their hollows provide nests currently suitable for these species. Trees rankings were re-assessed with none ranked higher than '4', with the initial higher rankings of Focused Vision (2020) downgraded to either a '4' or '5'. This included the Marri that recorded a ranking of '2' by Focused Vision (2020), which upon closer inspection did not provide a hollow and was re-ranked to '5'. Of the twenty-six native habitat trees recorded for removal in the application area none recorded a breeding habitat value higher than '4'.

No impacts to black cockatoo breeding habitat are likely. However, proposed clearing may remove a small component of roosting habitat currently utilised by the Forest Red-tailed Black Cockatoo, as well as 0.36 hectares of 'Moderate' black cockatoo foraging habitat.

The proposed clearing may be at variance with Principle (b).

The applicant has proposed a range of measures that will mitigate impacts that include (City of Armadale 2020):

- 1) Avoiding habitat trees. Seventeen native habitat trees will be retained. The majority of these large trees are along Forrest Road in the proximity of roosting habitat within Powell Reserve.
- 2) Replacing all removed mature native trees, by planting native tree species suitable for black cockatoo roosting, foraging, and breeding within the adjacent Powell Reserve, the site of a known black cockatoo roost site, at a rate of one native tree planted for each native tree removed.

Large habitat trees will remain along the Forrest Road reserve as not all are identified for removal, and others are located outside of the development footprint. Planting additional trees of appropriate species in the adjacent Powell Reserve will provide suitable mitigation as the application area is potentially a component of the same roost site. Improving the size and quality of Powell Reserve in the vicinity of the application area provides a direct and local mitigation to the impact arising from the proposed action, and contributes to the local Living Stream concept of DoW (2011) (see Principle f).

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, Threatened flora.

The application area is parkland cleared with no native understorey species present. No Threatened flora taxa have been recorded within the application area. According to available databases, 12 Threatened flora taxa have been recorded within the local area of a 10 kilometres radius of the application area.

The closest Threatened flora taxa recorded was *Diuris purdei* (Endangered), approximately 870 metres to the north-east, and 1.3 kilometres to the south-west. Apart from *Diuris purdei* other Threatened taxa recorded within five kilometres of the application area include; *Drakaea elastica* (Critically Endangered), *Eucalyptus x balanites* (Critically Endangered), *Lepidosperma rostratum* (Endangered), *Thelymitra stellata* (Endangered), and *Synaphea* sp. Serpentine (G.R. Brand 103) (Critically Endangered).

Due to the Completely Degraded condition of the application area, with a lack of native understorey, none of the identified Threatened taxa are likely to occur, and proposed clearing is not at variance with Principle (c).

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

No Threatened Ecological Communities (TECs) listed under the *Biodiversity Conservation Act 2016* or *Environment Protection and Biodiversity Conservation Act 1999*, (or Priority Ecological Communities), have been mapped or identified over the application area.

Eight TECs have been identified within the local area of a 10 kilometres radius of the application area. The closest of these are: the Critically Endangered *Corymbia calophylla*-*Kingia australis* woodlands on heavy soils, Swan Coastal Plain (SCP3a); the Vulnerable *Corymbia calophylla*-*Eucalyptus marginata* woodlands on sandy clay soils of the southern Swan Coastal Plain (SCP3b); and the Endangered *Banksia attenuata* and/or *Eucalyptus marginata* woodlands of the eastern side of the Swan Coastal Plain (SCP20b).

None of these TECs occur within two kilometres of the application area. Vegetation descriptions over the application area are not analogous with these communities, and given the Completely Degraded condition of the vegetation, and the distance to the nearest TEC, it is unlikely that the vegetation under application will be necessary for the maintenance of any of these communities. The proposed clearing is not at variance with Principle (d).

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The application area is located within the Swan Coastal Plain bioregion as described by Thackway and Cresswell (1995). The Swan Coastal Plain (IBRA) bioregion retains approximately 38.6 per cent of its pre-European vegetation extent.

The Beard vegetation association of Pinjarra 968.3 (Shepherd *et al*, 2001) has been mapped over the application area. Beard vegetation association Pinjarra 968.3 has just 6.6 per cent of its pre-European vegetation extent remaining (Government of Western Australia 2019). Hedde *et al*, (1980) described and mapped two separate Vegetation Complexes of the Darling System over the application area; the Guildford Complex 32 which has just 5.1 per cent of its pre-European vegetation extent remaining, and the Forrestfield Complex 29 which has 12.3 per cent of its pre-European vegetation extent remaining (Government of Western Australia 2019b).

These vegetation units are all below the 30 per cent threshold of the Government of Western Australia (2019b). However, the Environmental Protection Authority (EPA) recognises the Perth Metropolitan Region as a constrained area, which provides for the reduction of vegetation complexes to a minimum of 10 per cent of their pre-European extent (EPA, 2008). The native vegetation present over the application area consists of an admixture of Marri (*Corymbia calophylla*), Flooded Gum (*Eucalyptus rudis*), and Wandoo (*Eucalyptus ?wandoo*). The application area is thought to have been parkland cleared prior to 1953 (City of Armadale 2020), and due to its Completely Degraded condition, and lack of understorey, is not representative of these regional vegetation complexes. At the local scale of a ten kilometre radius approximately 11,249 hectares of native vegetation remains, representing 33.6 per cent of native vegetation cover. This figure is augmented by significant forest reserves to the east, and Jandakot Regional Park and Forrestdale Lake to the west.

The application area is not considered significant as a remnant of native vegetation in an area that has been extensively cleared and is not at variance with Principle (e). Nevertheless, the application area is located adjacent to areas of remnant native vegetation associated with Powell Reserve and weed and dieback management measures will assist in mitigating impacts to surrounding vegetation.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

No wetlands are present over the application area. The closest Ramsar listed wetland is Forrestdale Lakes located approximately 4.4 kilometres to the west. The closest areas listed within the Directory of Important Wetlands are Forrestdale Lake (WA077) approximately 3.3 kilometres to the west, and the Gibbs Road Swamp System (WA078) approximately 6.7 kilometres to the west.

The western end of Forrest Road within the application area is mapped within the 'Multiple Use' Armadale Palusplain, a Geomorphic Wetland of the Swan Coastal Plain (UFI 15797). The application area is located within the Canning River catchment, and Neerigen Brook, a tributary of the Canning River, enters the application area from the north-east through Werndley Reserve via an open trapezoidal drain and bisects the application area via an underground boxed culvert. Neerigen Brook is ephemeral with flows generally resultant of winter rainfall (City of Armadale 2020). The application area drains to the south-west into Powell Reserve via the Neerigen Brook South Main drain managed by the Water Corporation.

The 'Multiple Use' Armadale Palusplain has been mapped over a portion of the application area and the riparian species *Eucalyptus rudis* is present. Multiple use category wetlands have few remaining important attributes and functions, and the protection of these wetlands is of the lowest priority (EPA 2008; Water and Rivers Commission 2001). The multiple use wetland is approximately 60 per cent developed, with the remainder identified for urban development (City of Armadale 2020). The section of the Neerigen Brook drain that bisects the application area is a Water Corporation underground boxed culvert. Nevertheless, given the presence of a mapped wetland and the application area containing riparian vegetation, with eight *Eucalyptus rudis* trees identified for removal, the proposed clearing may be at variance with principle (f). Proposed clearing, however, will not obstruct, interfere or destroy any beds or banks of any watercourse or wetland.

To mitigate the loss of riparian vegetation, including eight *Eucalyptus rudis* trees, the applicant has committed to replacing removed mature trees with local species within the adjacent Powell Reserve at a rate of one native tree planted for each native tree removed. The Neerigen Brook South Main drain is a Resource Enhancement categorised artificial channel (UFI 7978), and immediately downstream of the application area the Neerigen Brook channel is proposed to be upgraded to a Living Stream (DoW 2011) as a requirement of the Wungong Urban Water project, with work already commenced. A section of 0.43 kilometres has already been converted to a Living Stream (City of Armadale 2020), with the 1.43 kilometre remainder due to be upgraded as development progresses (City of Armadale 2020). The replacement of all removed mature trees including *Eucalyptus rudis* will contribute to the Living Stream project in the adjacent Powell Reserve, and mitigate the loss of riparian vegetation.

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Three separate soil descriptions have been mapped over the application area. The Forrest Road east section consists of the EnvGeol Cs Phase, Sandy Clay (DPIRD 2017; Schoknecht *et al.*, 2004). That is, a white/grey to brown, fine to coarse-grained, sub-angular to rounded sand, clays of moderate plasticity, with gravel and silt layers near the scarp. The Forrest Road west section consists of the Pinjarra P3 Phase. That is, flat to very gently undulating plains with deep, imperfect to poorly drained acidic gradational yellow or grey-brown earths, and mottled yellow duplex soils, with loam to clay-loam surface horizons. The Eighth Road section consists of Bassendean B2 Phase. That is, a flat to very gently undulating sandplain with well to moderately well-drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan at one to two metres.

The acid sulfate soil risk over the application area has been assessed at a moderate to low risk. However, lower sub-surface acidification is rated higher over the Forrest Road east and Eighth Avenue sections. Groundwater salinity over the application area is mapped at 500 to 1,000 total dissolved salts (TDS) milligrams per litre (mg/L) (that is, 'fresh'). Salinity risk over the application area is associated with the soil type delineations and is generally low, however, over the Forrest Road east section (EnvGeol Cs Phase) 30 to 50 per cent of the mapped H2 unit has a moderate to high salinity risk.

Wind erosion risk over the application area is rated at low to moderate, with the soils of the Eighth Road section (Bassendean B2 Phase) rated at a higher risk (moderate) than the other sections. Water erosion, similarly, is rated at low to moderate with the Forrest Road east section (EnvGeol Cs Phase) rated at a higher risk (moderate) than the other sections.

A Construction Environmental Management Plan and a Dust Management Plan will be implemented, along with standard, and staged, road construction methodologies including strategies for drainage controls and wind and/or water erosion. Soils will not be excavated at depth, and any impacts to surrounding landscapes, soils and drainage can also be managed through appropriate design.

The proposed clearing is minimal and vegetation is currently in a Completely Degraded condition. The cleared area will be replaced with a hard road surface, drainage controls, and landscaping. Given the location, small scale of clearing, surrounding landscape, and standard methodologies implemented for road construction it is unlikely that the proposed clearing of portions of the Eighth Road and Forrest Road reserves would contribute to, or cause, appreciable land degradation. The proposed clearing is not at variance with Principle (g)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

The application area is not located within an Environmentally Sensitive Area (ESA), with the closest ESA located approximately 1.4 kilometres to the south-west and associated with the Hilbert Road Wetland, a Conservation category Sumpland.

Three Regional Parks are located within the local area; Wungong Regional Park approximately 2.5 kilometres to the east of the application area; Jandakot Regional Park approximately 4.7 kilometres to the west; and Banyowla Regional Park approximately 5.0 kilometres north east.

Two hundred and thirteen individual reserves managed by the Department of Biodiversity, Conservation and Attractions (DBCA) are located within the local area of a ten kilometre radius of the application area. The closest of these is an un-named reserve approximately two kilometres south-east (P038366 / 803), and an un-named nature reserve (R 42044) approximately 2.2 km to the south. Thirty-six Bush Forever sites, and four Bushforever Nominated Areas, are located in the local area, the closest of which is located approximately 2.1 kilometres to the south (ID 264). Fifty DBCA Land for Wildlife sites were also identified from the local area, with the closest approximately 2.9 kilometres distant.

The proposed clearing area is surrounded by developed urban areas. Due to the lack of adjacent or nearby conservation areas, and the distances to known conservation areas, proposed clearing is not likely to have any impact on any associated environmental values and is not at variance with Principle (h).

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

The application area is located within the Perth Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act), and a RIWI Act proclaimed river, the Neerigen Brook, also bisects the application area. However, the application is located well outside of any RIWI Act surface water and irrigation districts. The application area is also located well outside of any *Country Areas Water Supply Act 1947* (CAWS Act) control catchments or reserves, or any Public Drinking Water Source Areas, with the closest over six kilometres distant (Churchman Brook Catchment Area to the east, and the Jandakot Underground Water Pollution Control Area to the west).

Neerigen Brook, a tributary of the Canning River, enters the application area from the north-east through Werndley Reserve via an open drain, and exits the application area into an artificial channel (the Neerigen Brook South Main drain, outside of the application area). The Neerigen Brook drain bisects the application area via an underground boxed culvert. Proposed works will therefore not obstruct, interfere or destroy the beds or banks of this watercourse. Additionally, works associated with the clearing application will not intersect groundwater, and there is no requirement to take groundwater for the project, nor surface water from Neerigen Brook (City of Armadale 2020). Infiltration losses over the application area are low, with the majority of rainfall directed to the Neerigen Brook South Main drain (City of Armadale 2020). The road upgrades are not considered to substantially recharge the superficial aquifer of the Swan Coastal Plain.

Neerigen Brook is ephemeral with flows generally resultant of winter rainfall. The brook drains through the application area via an underground boxed culvert to the south-west into Powell Reserve. Immediately downstream of the application area the Neerigen Brook drain is proposed to be upgraded to a Living Stream as per DoW (2011) (City of Armadale 2020).

Detailed design of the road upgrades has considered water run-off management, particularly in respect to the downstream area of Neerigen Brook drain. Proposed works are confined to the Forrest Road reserve, and Water Corporation has approved the road works proposed to occur above the existing boxed culvert (City of Armadale 2020). The proposed road upgrade design levels are no more than 200 millimetres higher than the existing surface levels, with the majority of the road upgrade occurring at the existing natural surface. Surface water flow regimes will be maintained, and the proposed final design levels will not restrict or alter the flow regime of the Neerigen Brook drain (City of Armadale 2020).

Impacts to groundwater from the proposed clearing are unlikely, as are direct impacts to surface water. Indirect impacts to the downstream Neerigen Brook South Main drain (categorised as Resource Enhancement Wetland: UFI 7978) via construction works are possible, however, detailed design and standard construction methodologies are likely to mitigate potential impacts.

Given the small scale of the proposed clearing, the detailed design, and the standard construction methodologies employed, the proposed clearing is unlikely to cause deterioration in the quality of surface or underground water and is not likely to be at variance with Principle (i).

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

The application area experiences an annual average rainfall of approximately 866 millimetres, the majority received during the winter months, with the wettest being June and July (BOM 2020). Between 30 percent and 50 per cent of the mapped M2 unit over the application area has a moderate to high flood risk, and the Forrest Road sections have a high water-logging risk. The application area drains to the Neerigen Brook South Main drain which traverses the application area parallel to Forrest Road thereby contributing to the overall mapped flood risk.

The existing Water Corporation underground boxed culvert has been designed to incorporate flood risk and will not be altered (City of Armadale 2020), and the cleared areas will be replaced with hard road base and landscaping. Any potential for flooding will be managed through appropriate drainage design and construction to Australian Standards. Proposed clearing, is not likely to cause, or exacerbate, the incidence or intensity of flooding, and is not at variance with Principle (j).

Planning instruments and other relevant matters.

The application was advertised on the DWER website for a 21 day public comment period on 10 December 2019. No public submissions were received in relation to this application.

The proposal was referred by the City of Armadale to the Commonwealth Department of Environment and Energy (now the Department of Agriculture, Water and the Environment) on 16 September 2019 (EPBC Referral 2019/8538) (City of Armadale 2020).

The application area is located within the Perth Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). A RIWI Act proclaimed river, the Neerigen Brook drainage channel, bisects the application area. However, the Neerigen Brook drainage channel bisects the application area via an underground boxed culvert. Proposed works will not obstruct, interfere or destroy the beds or banks of this watercourse. Abstraction of groundwater or surface water will not be undertaken and additional permitting by DWER under the RIWI Act is not required (City of Armadale 2020).

The application area includes a component of Reserve 52509 (Powell Reserve) incorporating; Lot 166 on Plan 16056, Lot 8902 on Plan 69861, and Lot 3636 on Plan 16056. Reserve 52509 is vested with the Department of Planning, Lands and Heritage (DPLH), and managed by the City of Armadale for '*Drainage and Public Recreation*'. Reserve 52509 also incorporates a Water Corporation easement associated with the Neerigen Brook South Main drain.

The City of Armadale has submitted an application to the DPLH to excise a portion of Reserve 52509 to be dedicated as public road. DPLH has advised the City of Armadale that it has no objections to the request, or to the issuing of a clearing permit. (DPLH 2019).

DPLH advised DWER on 19 December 2019 that it has no objection to application CPS 8722/1 (DPLH 2020).

The City of Armadale has requested Water Corporation consent to partially surrender a portion of its easements for Drainage purposes (N991734) and Sewage purposes (N991735). The Water Corporation has provided the City of Armadale consent (Water Corporation 2019).

The application area is located within the boundaries of the Whadjuk People Indigenous Land Use Agreement (WI2017/015). No Aboriginal sites of significance have been recorded within the application area. Neerigen Brook 1 (ID 3714) is an Aboriginal Heritage Place located approximately 120 metres north-east of the application area, and Southern River (ID 3511) is a registered site located approximately 370 metres to the west. It is the applicant's responsibility to ensure compliance with any obligations under the *Aboriginal Heritage Act 1972*.

4. References

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5. GIS Datasets

- Aboriginal Sites of Significance
- Clearing Regulations - Environmentally Sensitive Areas
- Carnaby's cockatoo: breeding, roosting, feeding
- Department of Biodiversity Conservation and Attractions, Tenure
- Geomorphic Wetlands, Swan Coastal Plain
- Groundwater salinity, statewide
- South west forest vegetation complexes
- Hydrology, linear
- IBRA Australia
- Land for Wildlife
- PDWSA, CAWSA, RIWI Act Areas
- Remnant vegetation
- SAC Biodatasets (accessed January 2019)
- Soils, statewide
- South coast significant wetlands
- Town Planning Scheme Zones