



## CLEARING PERMIT

*Granted under section 51E of the Environmental Protection Act 1986*

<b>Purpose Permit number:</b>	CPS 7992/1
<b>Permit Holder:</b>	Commissioner of Main Roads Western Australia
<b>Duration of Permit:</b>	From 27 June 2018 to 27 June 2023

### ADVICE NOTE

The funds referred to in condition 9 of this permit are intended for contributing towards the purchase of 7.37 hectares of native vegetation with similar environmental values containing Black cockatoo and threatened ecological community habitat within the Swan Coastal Plain Bioregion.

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

**1. Purpose for which clearing may be done**

Clearing for the purpose of road construction and upgrades including associated activities.

**2. Land on which clearing is to be done**

Armadale Road Reserve (PIN 1203675), Banjup  
Armadale Road Reserve (PIN 11868129), Banjup  
Liddelow Road Reserve (PIN 11868128), Banjup  
Lot 7 on Deposited Plan 13599, Banjup  
Lot 8 on Deposited Plan 13599, Banjup  
Lot 24 on Deposited Plan 13599, Banjup  
Lot 140 on Deposited Plan 226007, Banjup  
Lot 2 on Diagram 26166, Banjup  
Lot 4 on Diagram 39564, Banjup  
Lot 571 on Deposited Plan 14419, Banjup  
Lot 614 on Deposited Plan 190387, Banjup  
Lot 715 on Deposited Plan 219864, Banjup  
Lot 716 on Deposited Plan 219865, Banjup  
Lot 33 on Deposited Plan 71376, Forrestdale  
Lot 34 on Deposited Plan 71376, Forrestdale  
Lot 35 on Deposited Plan 226007, Forrestdale  
Lot 36 on Deposited Plan 226007, Forrestdale  
Lot 111 on Diagram 95751, Forrestdale  
Lot 718 on Deposited Plan 219866, Forrestdale

**3. Area of clearing**

The Permit Holder must not clear more than 2.46 hectares of native vegetation within the combined areas cross-hatched yellow on attached Plan 7992/1(a) and Plan 7992/1(b).

**4. Application**

This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

**5. Type of clearing authorised**

This Permit authorises the Permit Holder to clear native vegetation for the activities described in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for those activities under the *Main Roads Act 1930* or any other written law.

**PART II –MANAGEMENT CONDITIONS**

**6. Avoid, minimise and reduce the impacts and extent of clearing**

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:

- (a) avoid the clearing of native vegetation;
- (b) minimise the amount of native vegetation to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

**7. Dieback and weed management**

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.

**8. Offset**

The Permit Holder must fund the purchase of the area cross-hatched red on attached Plan 7992/1(c) for inclusion in the conservation estate managed by the Department of Biodiversity, Conservation and Attractions.

**9. Monetary contributions to a fund maintained for the purpose of establishing or maintaining vegetation (offset)**

Prior to undertaking any clearing authorised under this Permit and no later than 30 December 2018, the Permit Holder shall provide documentary evidence to the CEO that funding of \$74,436 has been transferred to the Department of Water and Environmental Regulation for the purpose of establishing or maintaining native vegetation.

**PART III - RECORD KEEPING AND REPORTING**

**10. Records must be kept**

The Permit Holder must maintain the following records for activities done in pursuant to this Permit:

- (a) In relation to the clearing of native vegetation authorised under this Permit:
  - (i) 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;
  - (ii) the date that the area was cleared; and
  - (iii) the size of the area cleared (in hectares);
- (b) Actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of the Permit;
- (c) Actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 7 of the Permit; and
- (d) In relation to the offset pursuant to condition 8 of this Permit:
  - (i) the date the area was purchased.

## 11. Reporting

The Permit Holder must provide to the *CEO* the records required under condition 10 of this Permit, when requested by the *CEO*.

## 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;

*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; and

*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.



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Samara Rogers  
A/MANAGER  
CLEARING REGULATION

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

30 May 2018

# Plan 7992/1 (a)



## Legend

- Areas approved to clear
- Roads
- LGA cadastre
- Cadastre
- WANow\_Imagery

700



700 m



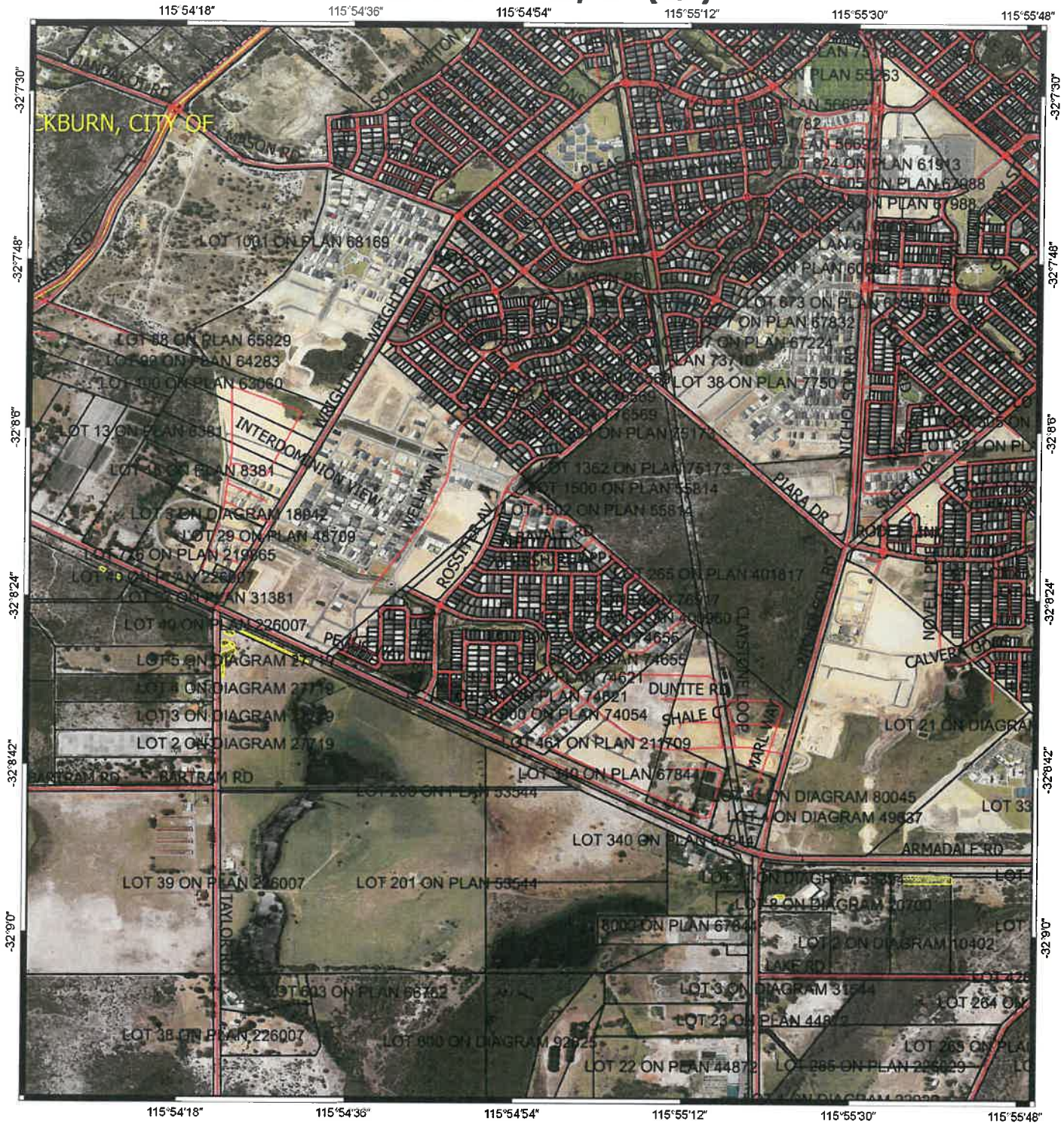
MGA 94  
Geocentric Datum of Australia 1994

*S. Lopez*  
Date 30/5/2018  
Officer with Delegated authority under Section 20  
of the Environmental Protection Act 1986



GOVERNMENT OF  
WESTERN AUSTRALIA

# Plan 7992/1 (b)



## Legend

- Areas approved to clear
- Roads
- LGA cadastre
- Cadastre
- WANow\_Imagery

900



900 m



MGA 94  
Geocentric Datum of Australia 1994

*James Rogers* Date: *30/5/2018*  
 Officer with delegated authority under Section 20  
 of the Environmental Protection Act 1986



GOVERNMENT OF  
WESTERN AUSTRALIA



# Plan 7992/1 (c)

115°43'30"



115°43'30"

## Legend

-  Clearing Instrument Conditions
-  LGA
-  cadastre
-  Cadastre
-  WANow\_Imagery

200



200 m



MGA 94  
Geocentric Datum of Australia 1994

*J. Hayes* Date *30/5/2015*  
*James Hayes*  
Officer with delegated authority under Section 20  
of the Environmental Protection Act 1986



GOVERNMENT OF  
WESTERN AUSTRALIA



## 1. Application details

### 1.1. Permit application details

Permit application No.: 7992/1  
Permit type: Purpose Permit

### 1.2. Applicant details

Applicant's name: Commissioner of Main Roads Western Australia  
Application received date: 15 February 2018

### 1.3. Property details

Property: Lot 8 on Plan 13599, Banjup  
Lot 7 on Plan 13599, Banjup  
Lot 718 on Plan 219866, Forrestdale  
Lot 716 on Plan 219865, Banjup  
Lot 715 on Plan 219864, Banjup  
Lot 6 on Plan 13599, Banjup  
Lot 614 on Plan 190387, Banjup  
Lot 571 on Plan 14419, Banjup  
Lot 4 on Diagram 39564, Banjup  
Lot 40 on Plan 226007, Forrestdale  
Lot 36 on Plan 69547, Forrestdale  
Lot 35 on Plan 226007, Forrestdale  
Lot 34 on Plan 71376, Forrestdale  
Lot 33 on Plan 71376, Forrestdale  
Lot 2 on Diagram 26166, Banjup  
Lot 24 on Plan 13599, Banjup  
Lot 140 on Plan 226007, Banjup  
Lot 111 on Diagram 95751, Forrestdale  
Lot 10 on Diagram 95591, Forrestdale  
Road reserve - 11868128, Banjup  
Road reserve - 11868129, Banjup  
Road reserve - 1203675, Banjup  
Local Government Authority: City of Armadale and City of Cockburn  
Localities: Forrestdale and Banjup

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
2.46		Mechanical Removal	Road construction or upgrades

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 30 May 2018

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* (EP Act). It has been concluded that the proposed clearing is at variance to principles (a), (b), (d), (f), (h) and (i), may be at variance to principle (e), and is not likely to be at variance to the remaining principles.

It is considered that the proposed clearing will result in the following impacts:

- loss of up to 2.08 hectares of native vegetation that comprises foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*), forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*), and Baudin's cockatoo (*Calyptorhynchus baudinii*);
- loss of up to 1.06 hectares of the *Banksia* Woodlands of the Swan Coastal Plain threatened ecological community;
- loss of up to 0.52 hectares of resource enhancement wetland vegetation;
- loss of approximately 2.21 hectares of quenda (*Isodon obesulus* subsp. *fusciventer*) habitat;
- loss of up to 0.54 hectares of Jandakot Regional Park;
- loss of up to 0.6 hectares of Bush Forever sites;
- the potential to cause deterioration in the quality of surface and underground water; and
- the potential to spread dieback and weeds into adjacent conservation areas.

The applicant has avoided and minimised impacts through design choices which have been outlined within Section 3 under Table 1.

After consideration of the above, the Delegated Officer determined that:

- the acquisition and conservation of 7.37 hectares of remnant native vegetation will counterbalance significant residual impacts to biodiversity, black cockatoo foraging habitat, the *Banksia* Woodlands of the Swan Coastal Plain threatened ecological community, Bush Forever sites and Jandakot Regional Park;
- the acquisition, conservation and management of 1.47 hectares of a resource enhancement wetland will counterbalance significant residual impacts to wetlands; and
- implementing weed and dieback hygiene measures will mitigate the risk of significant impacts to adjoining native vegetation and conservation areas.

The Delegated Officer took into consideration that this application is related to a previously granted Clearing Permit CPS 7623/1, which is adjacent to the application area. The Delegated officer considered the accumulation of impacts, and considered that the offset is consistent with that approved for CPS 7623/1.

The Delegated Officer also took into consideration that upgrades to the road will provide a public benefit including improved road safety.

In determining to grant a clearing permit subject to offset conditions and dieback and weed management conditions, the Delegated Officer determined that the proposed clearing is unlikely to lead to an unacceptable risk to the environment.

## 2. Site Information

### Clearing Description

The application is to clear 2.46 hectares of native vegetation within various properties and road reserves within the localities of Forrestdale and Banjup, for the purpose of constructing a second carriageway on Armadale Road, between Tapper Road in Atwell and Anstey Road in Forrestdale (see figures 2 and 3).

The application is part of a larger project that will include the duplication of Armadale Road between Tapper Road and Anstey Road, improvements and upgrades of various intersections, and associated works including lighting, service relocations and drainage (see Figure 1) (MRIA 2017). The overall project area comprises a total area of approximately 63.90 hectares, including 43.70 hectares of cleared areas or existing road infrastructure and 20.19 hectares of vegetation, including 6.99 hectares of planted vegetation (Strategen 2017).

This application is related to Clearing Permit CPS 7623/1 which involved the proposed clearing of 12.4 hectares to facilitate the abovementioned project. The applicant determined that additional clearing was required to facilitate the project, and hence the applicant applied for an additional 2.46 hectares under the current clearing permit application, being CPS 7992/1.

### Vegetation Description

A detailed flora and vegetation assessment (the Assessment) of the application area was undertaken by the Metropolitan Road Improvement Alliance (MRIA 2017). The detailed flora and vegetation assessment included a desktop assessment, field surveys including floristic sampling and targeted searches, and data analysis (MRIA 2017). The Assessment considered the findings of a number of other biological surveys which were undertaken for the larger project area, including a Level 2 vegetation and flora survey conducted on 27, 29 and 30 October 2015 (undertaken by Astron), and supplementary surveys undertaken by Strategen in July 2016 and April 2017 (MRIA 2017).

The Assessment identified that the application area comprises the following vegetation types, whereby weed species are denoted by \* (MRIA 2017):

- **BaBm** (comprises approximately 0.04 hectares of the application area): *Banksia attenuata*, *Banksia menziesii* and *Banksia ilicifolia* low woodland (with *Eucalyptus marginata* scattered trees) over *Xanthorrhoea preissii* and *Macrozamia riedlei* open shrubland over *Dasypogon bromeliifolius* and *Phlebocarya ciliata* or *Desmocladius flexuosus* open herbland to closed herbland;
- **BaHhBm** (comprises approximately 1.37 hectares of the application area): *Banksia attenuata*, *Banksia menziesii*, and *Allocasuarina fraseriana* low woodland over *Hibbertia hypericoides*, *Scholtzia involucreta*, *Stirlingia latifolia*, *Allocasuarina humilis* and *Acacia pulchella* var. *glaberrima* mid heath shrub with \**Briza maxima*., \**Ehrharta calycina*, *Amphipogon turbinatus* and \**Aira caryophyllea* low sparse grassland over \**Ursinia anthemoides*, *Conostylis aurea*, *Lechenaultia biloba*, *Chamaescilla corymbosa* var. *corymbosa* and \**Gladiolus caryophyllaceus* low herbland;



- **MpKg** (comprises approximately 0.52 hectares of the application area): *Melaleuca preissiana* low open forest over *Kunzea glabrescens* and *Jacksonia furcellata* tall shrubland over *Ehrharta calycina* and *Briza maxima* low grassland with *Melaleuca huegelii*, *Acacia pulchella* var. *glaberrima* and *Xanthorrhoea preissii* mid sparse shrubland over *Lepidosperma scabrum* low open sedgeland;
- **Kg** (comprises approximately 0.32 hectares of the application area): *Kunzea glabrescens* tall open scrub to closed tall scrub over *Dasypogon bromeliifolius* or *Phlebocarya ciliata* low open shrubland; and
- Scattered native trees over paddocks (comprises approximately 0.216 hectares of the application area).

The application area has also been broadly mapped as the following Swan Coastal Plain vegetation complexes (Government of Western Australia 2018):

**Bassendean Complex-Central And\South:** Vegetation ranges from woodland of *Eucalyptus marginata* (Jarrah) - *Allocasuarina fraseriana* (Sheoak) - *Banksia* species to low woodland of *Melaleuca* species, and sedgelands on the moister sites. This area includes the transition of *Eucalyptus marginata* (Jarrah) to *Eucalyptus todtiana* (Pricklybark) in the vicinity of Perth; and

**Southern River Complex:** Open woodland of *Corymbia calophylla* (Marri) - *Eucalyptus marginata* (Jarrah) - *Banksia* species with fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca raphiophylla* (Swamp Paperbark) along creek beds.

#### Vegetation Condition

The Assessment identified the vegetation within the application area as being in the following condition (MRIA 2017):

- Completely Degraded (0.216 hectares);
- Degraded (1.057 hectares);
- Good (0.378 hectares);
- Good to Very Good (0.003 hectares); and
- Very Good (0.809 hectares).

#### Soil type

The application area is mapped as the following landform types:

**Bassendean B1 Phase** described as Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 metres; banksia dominant;

**Bassendean B2 Phase** described as 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 1-2 metres; and

**Bassendean B3 Phase** described as Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam (Department of Primary Industries and Regional Development 2018).



Figure 1. Larger Road Upgrade Project Area Encompassing the Application Area



Figure 2: Western portion of the application area



Figure 3: Eastern portion of the application area

### 3. Minimisation and mitigation measures

The applicant has provided a number of avoidance and mitigation measures in response to DWER's letter of 18 May 2018, which requested additional information from the applicant. These measures are detailed within Table 1 below (MRWA, 2018).

Table 1. Environmental Impact Avoidance and Mitigation Measures.

Design or Management Measure	Applied to Current Design	Discussion and Justification
Steepen batter slopes	Yes	Batters have been steepened to 1:3 in areas of native vegetation. Should the batters be any steeper, erosion cannot be managed and therefore landscaping efforts produce little results. This technique has seen the retention of native vegetation, particularly that north of the current Liddelow Road and Armadale Road intersection (black cockatoo foraging habitat and TEC). Should the usual 1:4 batter be used, this would have seen the clearing area extend another 3 metres (m), resulting in an additional 0.15 hectares (ha) (approx.) of clearing.
Installation of safety barriers	Yes	In line with the above, barriers have been provided for steep batter slopes. There are no other areas where the provision of a barrier to facilitate the steepening of batters would result in a material reduction to clearing of native vegetation. A large portion of the required clearing occurs at steep cut batters, where there is no possibility to reduce clearing by the installation of barriers.
Alignment to one side of existing road	No	This management measure is not particularly relevant in this situation, as native vegetation occurs on both sides of the existing road. This management measure is more pertinent to agricultural areas, where the only vegetation to occur is in the road reserve.

Alternative alignment to follow existing road (or) to preferentially locate within pasture or a degraded areas	Yes	The general approach to the Armadale Road Upgrade project has been to maximise use of the existing cleared areas, whilst minimising impacts on the environment and community (i.e. minimise land take). At the Liddelow/Armadale intersection, the southern carriageway is predominately to be built in the paddock southeast of the current alignment. At the Taylor/Armadale intersection, the additional land required has been selected based on the environmental values on either side of the existing Taylor Road. The isolated trees included in this application are found on the east side of the existing road, and have no native understory. Should the western side of the road be used instead, this would have impacted vegetation in Bush Forever site 344, which contains native vegetation which has had minimal impacts in the past.
Installation of kerbing	No	<p>The inclusion of kerbing will have limited impact on the road construction footprint due to the offset requirements for road safety and drainage requirements. However kerbing the entire project length would have resulted in additional clearing as larger drainage basins would have been required to detain road runoff. Kerbing the entire road would have resulted in a number of other negative environmental outcomes, including depriving adjacent vegetation of water and further altering the hydrological regime by requiring point source infiltration at basins away rather than promoting infiltration at source.</p> <p>Kerbing has been incorporated for the project predominately at intersections with local roads. For the remaining areas of the project, the existing drainage strategy has been adopted, namely infiltration at source. This approach allows for the minimisation of acquiring additional land (and potential clearing) for surface water storage, and more importantly, it continues to feed water to adjacent vegetation, including Bush Forever areas. The drainage strategy for this project was reviewed by and discussed with DBCA and Bush Forever, with no issues raised in the clearing permit application areas. Correspondence with these two parties is provided in Attachment 2.</p>
Simplification of design to reduce number of lanes and/or complexity of intersections	No	<p>Armadale Road suffers from significant congestion and contains numerous black-spots along its length. The introduction of roundabouts, which typically have a larger footprint than signalised junctions, is in-line with providing a safe systems design whilst improving traffic flow.</p> <p>Main Roads commissioned a traffic report that compared a number of options including number of lanes and intersection configuration. The scope of the project is in line with the findings of that report, which showed a scaled back option would result in significantly reduced performance on the network. The original scope included an at grade intersection at the Armadale Road/Nicholson Road intersection, which had a slightly larger footprint than the grade-separated roundabout that is currently in the scope.</p>
Preferential use of existing cleared areas for access tracks, construction storage and stockpiling	Yes	No temporary clearing of native vegetation will occur for access tracks, storage or stockpiles. Site offices will be located in areas which have been disturbed in the past. Existing tracks will be used in preference of clearing for additional access.
Drainage modification	Yes	As summarised above in relation to kerbing, the existing drainage strategy has been continued as part of this project. Any major drainage modification, such as kerbing the entire alignment, would require additional drainage bunds which would then increase the clearing footprint. The drainage strategy does include the capture of the first flush event following rainfall, thereby containing contaminants within the road reserve.
<i>Other design treatment</i> List any additional avoidance and measures considered during the project design process.	Yes	<p>North of Armadale Road east of Liddelow Road, a steep cut batter has been designed, as the Bush Forever site 390 is significantly higher than the current road. The footprint of the cut batter has been significantly reduced through the inclusion of a 110 m (approx.) retaining wall. This retaining wall allows the batter to finish next to the road in a higher place.</p> <p>Additionally the reduction of verge widths (land directly adjacent to the road carriageway) and the grade of verges away from the road reduces the clearing footprint further.</p>

(MRWA 2018)

#### 4. Assessment of application against clearing principles

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

###### Comments

###### **Proposed clearing is at variance to this Principle**

The applicant commissioned a detailed flora and vegetation assessment of the application area, which included a desktop assessment, field surveys including floristic sampling and targeted searches (incorporating three surveys), and data analysis, which included (MRIA 2017):

- Survey 1, which was undertaken on 25 August, 2017, and involved the establishment of three permanent quadrats with floristic data collected from these and three relevés (whereby only native vegetation in good or better condition was represented by quadrat data);
- Survey 2, which was undertaken on 29 September 2017 at which time all quadrats and some relevés were visited and all flora species were recorded; and
- Survey 3 (targeted), which was undertaken on 26 and 27 September and involved walking transects within suitable habitat for the rare flora species *Caladenia huegelii*.

The findings of these surveys were provided to DWER in the form larger document titled 'Clearing Permit Amendment Supporting Document' which will herein be referred to as the Assessment.

The Assessment noted that a total of 104 species from 78 genera and 42 families were identified within the larger survey area encompassing the application area (MRIA 2017). As discussed under Section 2, five vegetation types were recorded within the application area. These vegetation types include two *Banksia* woodland vegetation types (BaHhBm and BaBm), one wetland vegetation type (MpKgLs), and two degraded communities, (Kg and scattered native trees over paddocks) (MRIA 2017). The Assessment noted that BaHhBm (comprising *Banksia attenuata*, *Banksia menziesii*, and *Allocasuarina fraseriana* low woodland) was the dominant vegetation type within the application area (MRIA 2017).

The recorded wetland vegetation type (MpKgLs, comprising 0.52 hectares of the application area) appears to be growing in association with a geomorphic wetland that intersects the application area, which is classified as a resource enhancement wetland (sumpland). The Assessment notes that both locations were historically cleared and significantly burnt in the past, with the present vegetation representing regrowth from approximately 1995, which has resulted in dense colonising species such as *Kunzea glabrescens* and weeds (*Ehrharta calycina*) (MRIA 2017). Resource enhancement wetlands are classified as priority wetlands which may have been partially modified but still retain substantial ecological attributes and functions (Water and Rivers Commission 2001).

The Assessment identified that the vegetation ranged from a completely degraded to very good (Keighery, 1994) condition, which was predominantly the result of historical clearing for urban development (see Section 2 for detailed information on vegetation condition) (MRIA 2017).

The local area considered in the assessment of this application is defined as a 10 kilometre radius surrounding the application area. The local area retains approximately 18.72 per cent native vegetation cover (9,881 hectares).

While there are several conservation significant flora species known from the local area, the abovementioned detailed flora and vegetation assessment did not identify any rare or priority flora species within the application area (MRIA 2017). Furthermore no rare flora species were identified within the application area during biological surveys undertaken for the larger project area, which overlap various portions of the application area. The application area is considered to have been adequately surveyed, and it is therefore considered that the proposed clearing is not likely to impact on any rare or priority flora species.

As outlined in the assessment under principle (b), the application area contains suitable foraging habitat for forest red-tailed black cockatoo (*Calyptorhynchus banksii* subsp. *naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*), and Carnaby's cockatoo (*Calyptorhynchus latirostris*). The application area also provides suitable habitat for quenda (*Isodon obesulus*), and provides an ecological linkage that facilitates landscape connectivity and contributes to fauna dispersal between larger isolated bushland fragments. Therefore, it is considered that the application area comprises significant habitat for conservation significant fauna.

As outlined in the assessment of principle (d), the application area includes 1.06 hectares of vegetation that is considered to be an occurrence of the Commonwealth listed threatened ecological community (TEC) known as 'Banksia Woodlands of the Swan Coastal Plain' (herein referred to as the Banksia Woodlands TEC) and the State listed priority ecological community (PEC) known as 'Banksia Dominated Woodlands of the Swan Coastal Plain IBRA Region' (Priority 3).

As outlined in the assessment of principle (h), the application area intersects two Bush Forever (BF) sites, which comprise a total of 0.60 hectares. Approximately 0.03 hectares comprises BF site 344 (Gibbs Road Swamp Bushland, Banjup/Forrestdale) and approximately 0.57 hectares comprises BF site 390 (Fraser Road Bushland, Banjup). The application area includes approximately 0.52 hectares of native vegetation within Crown Reserve 1820 (known as Rose Shanks Reserve – also contained within the larger BF site 390) and approximately 0.02 hectares of native vegetation within Crown Reserve 8129, with both reserves included within the larger Jandakot Regional Park.

Mechanical clearing increases the risk of spreading weeds and dieback into native vegetation adjacent to the application area, including vegetation associated with the abovementioned conservation areas. Potential impacts to remnant native vegetation outside the application area as a result of the proposed clearing may be minimised by the implementation of weed and dieback management practices.

Given that the application area contains areas of vegetation in very good (Keighery 1994) condition, supports vegetation that is mapped as a PEC, is considered to be an occurrence of a TEC, and contains significant habitat for conservation significant fauna, the proposed clearing is at variance to this Principle.

Taking into account the applicant's avoidance and minimisation measures outlined under section 3, it is considered that the applicants proposed offsets will counterbalance the impacts to biodiversity. Section 6 provides further information on the offsets proposed by the applicant.

**(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 indigenous to Western Australia.**

**Comments**

**Proposed clearing is at variance to this Principle**

Three broad fauna habitat types were identified within the application area, which include the following (MRIA 2017):

- Woodland (1.69 hectares) - this habitat varies from moderate canopy cover, good quality *Banksia*, *Allocasuarina* and *Eucalyptus marginata* woodland, to very open and degraded woodlands which contain occasional small trees and minimal groundcover;
- Isolated Trees Over Paddocks (0.22 hectares) - this habitat generally comprises cleared areas with scattered large mature native or introduced trees; and
- Riparian Vegetation (0.52 hectares) – this habitat type predominantly includes varied density *Melaleuca* sp. and other riparian vegetation such as *Kunzea*.

Based on known records, and the suitability of habitat within the application area, the Assessment noted that the following conservation significant fauna species are likely to occur within the application area (MRIA 2017):

- Rainbow Bee-eater (*Merops ornatus*) – protected under international agreement;
- Quenda – listed as Priority 4 by the Department of Biodiversity, Conservation and Attractions (DBCA);
- Perth Lined Skink – (*Lerista lineata*) - listed as Priority 3 by DBCA;
- Carnaby's Cockatoo – classified as 'fauna that is rare or is likely to become extinct as endangered fauna' under the *Wildlife Conservation (Specially Protected Fauna) Notice 2017* (WC Notice);
- Forest red-tailed black cockatoo - classified as 'Fauna that is rare or is likely to become extinct as vulnerable fauna' under the WC Notice; and
- Great Egret – (*Ardea modesta*) - protected under international agreement.

In addition to these species, it is also considered that the Baudin's cockatoo (classified as 'fauna that is rare or is likely to become extinct as endangered fauna' under the WC Notice) may utilise the application area. Together with the forest red-tailed black cockatoo and the Carnaby's cockatoo, these three species are collectively known as black cockatoos.

Black cockatoos have a preference for foraging habitat that includes jarrah and marri woodlands and forest heathland and woodland dominated by proteaceous plant species such as *Banksia* sp., *Hakea* sp. and *Grevillea* sp. (Commonwealth of Australia 2012). The application area contains *Banksia* woodland, and scattered marri and jarrah (MRIA 2017), and is therefore considered to provide suitable foraging habitat for black cockatoos.

A targeted black cockatoo survey of the application area identified Carnaby's cockatoo foraging evidence in the form of chewed banksia cones (for grub extraction), and forest red-tailed black cockatoo foraging evidence, in the form of chewed *Corymbia calophylla* fruit within *Kunzea glabrescens* tall shrubland adjacent to the application area (MRIA 2017). The survey identified that the application area comprises approximately 2.08 hectares of moderate quality foraging habitat for black cockatoo's (MRIA 2017).

The recovery plan for Carnaby's cockatoo defines breeding habitat as including nesting sites, and the foraging habitat and water sources within foraging distance of nesting sites (Parks and Wildlife 2013). These areas are considered to be habitat critical to the survival of Carnaby's cockatoo (Parks and Wildlife, 2013). The loss or degradation of foraging habitat within 12 kilometres of nesting sites is considered to pose the greatest risk to Carnaby's cockatoo (Parks and Wildlife 2013). The application area occurs on the border of the buffer of a confirmed Carnaby's cockatoo nesting site.

Given the above, and that the application area comprises 2.08 hectares of suitable foraging habitat on the heavily fragmented swan coastal plain, the application area is considered to provide significant foraging habitat for black cockatoos, particularly noting that approximately 4.85 hectares of nearby suitable foraging habitat will be cleared under the historically approved clearing permit CPS 7623/1, which is part of the larger Armadale Road upgrade project.

To be suitable as a black cockatoo breeding site, trees require a suitable nest hollow or be of a suitable diameter at breast height (DBH) to develop a nest hollow. For most tree species, a suitable DBH is 500 millimetres (Commonwealth of Australia, 2012). The targeted black cockatoo survey identified two trees considered large enough provide nesting habitat (diameter at breast height [DBH], greater than 50 cm), however no hollows were identified within these trees (MRIA 2017).

On this basis, while the application area is adjacent to a confirmed breeding area for Carnaby's cockatoo, the proposed clearing is not likely to impact on significant breeding habitat for black cockatoos.

Quenda inhabit scrubby, often swampy vegetation with dense cover up to one metre high and often feed in areas of pasture and croplands lying close to dense cover (DEC 2012). The Assessment noted that the application area comprises 2.21 hectares of habitat suitable for the Quenda (MRIA 2017).

The native vegetation within Armadale Road reserve functions as an ecological linkage to regional parks and other remnants of native vegetation within the local area. The proposed clearing is likely to increase edge effects with adjacent vegetation and contribute to the degradation of the fauna corridor, via increased fragmentation and through the potential spread of weeds and dieback.

On the basis that the application area comprises significant foraging habitat for black cockatoos, habitat for quenda and provides an ecological linkage facilitating landscape connectivity and contributing to fauna dispersal between larger isolated bushland fragments, it is considered that the vegetation within the application area comprises significant habitat for indigenous fauna.

Given the above, the proposed clearing is at variance to this Principle.

Taking into account the applicant's avoidance and minimisation measures, it is considered that the applicants proposed offset will counterbalance impacts to significant fauna habitat. Section 6 provides further information on the proposed offset.

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

**Comments**

**Proposed clearing is not likely to be at variance to this Principle**

According to available databases, thirteen rare flora species have been recorded within the local area (ten kilometre radius). The closest records are *Caladenia huegelii*, *Drakaea micrantha* and *Drakaea elastica*.

*Caladenia huegelii* is classified as 'flora that are considered likely to become extinct or rare, as critically endangered flora' under the *Wildlife Conservation (Rare Flora) Notice 2017 (WC Flora Notice)*. This species is a spider orchid that grows in deep sandy soil, in mixed woodland of jarrah and *Banksia*. The species occurs in scattered localities over a range of 315 kilometres, from just north of Perth to near Margaret River and tends to favour areas of lush undergrowth. This species flowers September to October (Brown et al. 1998).

*Drakaea micrantha* is classified as 'flora that are considered likely to become extinct or rare, as endangered flora' under the WC Flora Notice. This species is a hammer orchid which inhabits infertile grey sands in common sheoak and jarrah woodland or forest. This species usually grows on old firebreaks and in disturbed sites where competition from other plants has been removed. This species flowers September to October (Brown et al. 1998).

*Drakaea elastica* is classified as 'flora that are considered likely to become extinct or rare, as critically endangered flora' under the WC Flora Notice. This species grows on bare patches of (usually white or grey) sand within otherwise dense vegetation in low-lying areas, often alongside winter-wet swamps, typically in *Banksia menziesii*, *Banksia attenuata* and *Banksia ilicifolia* woodland or *Kunzea glabrescens* thicket vegetation (DEC 2008). Individual plants may not flower every year and the plant dies back to a dormant underground tuber over summer. The best time to look for this species is in July and August when the leaves are relatively conspicuous (DEC 2008).

A biological assessment which incorporated a Level 2 vegetation and flora survey, undertaken on 27, 29 and 30 October 2015 by Astron for the larger road upgrade project area, did not identify any rare flora species within the application area (MRIA 2017). A further targeted rare flora survey within the project area was undertaken by Strategen in July 2017, to account for the differing flowering period of *Drakaea elastica*. This survey did not locate any rare flora (MRIA 2017). A further detailed flora and vegetation assessment, specific to the application area, which included a desktop assessment, field surveys including floristic sampling and targeted searches (incorporating three surveys), and data analysis was undertaken and incorporated the following (MRIA 2017):

- Survey 1, which was undertaken on 25 August, 2017, and involved the establishment of three permanent quadrats with floristic data collected from these and three relevés (whereby only native vegetation in good or better condition was represented by quadrat data);
- Survey 2, which was undertaken on 29 September 2017 at which time all quadrats and some relevés were visited and all flora species were recorded; and
- Survey 3 (targeted), which was undertaken on 26 and 27 September and involved walking transects within suitable habitat for the rare flora species *Caladenia huegelii*. Prior to commencing the survey, known populations of *C. huegelii* were checked for flowering. When at least 60% of the populations were observed in flower the targeted survey was undertaken.

Surveys 1 and 2 did not identify any rare flora species. Survey 3 identified one *Caladenia huegelii* individual within *Banksia* woodland on grey deep sandy soils, within close proximity of the application area (MRIA 2017). The recovery plan for this species advises that habitat critical to the survival of this species includes the area of occupancy of important populations and areas of similar habitat surrounding important populations.

The application area includes approximately 0.26 hectares of *Banksia* woodland located within 300 metres of a *Caladenia huegelii* population. Noting that this portion of woodland comprises a narrow linear corridor of degraded remnant vegetation, between areas of historical clearing, it is unlikely that this portion of the application area provides critical habitat for *Caladenia huegelii*.

Noting the above, and that no rare flora species were recorded within the application area, the application area is unlikely to include, or be necessary for the continued existence of rare flora.

It is considered that the targeted flora surveys were undertaken at the appropriate time of year, the survey intensity was adequate and the level of information provided was sufficient to adequately determine impacts to rare flora.

Given the above, the proposed clearing is not likely to be at variance to this Principle

**(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.**

**Comments Proposed clearing is at variance to this Principle**

Approximately two hectares of the application area is mapped as the 'Banksia Woodlands of the Swan Coastal Plain' (*Banksia* woodlands) ecological community listed as Priority 3 by DBCA, whereby these areas are also recognised as 'likely to occur' areas of the *Banksia* Woodlands TEC, listed as endangered under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act).

The Commonwealth Department of the Environment and Energy's (DotEE) mapping provides an indicative distribution of the *Banksia* Woodlands TEC, defining areas mapped as 'likely to occur' and 'may occur'. The approved conservation advice for this community states that "Ground-truthing (e.g. an on-ground survey) is required to verify if a particular site meets the required key diagnostic characteristics and minimum condition thresholds to be the described ecological community" (Threatened Species Scientific Committee 2016).

The *Banksia* Woodlands TEC is commonly dominated or co-dominated by *Banksia attenuata* and/or *Banksia menziesii*. Other *Banksia* species that may dominate include *Banksia prionotes* or *Banksia ilicifolia* (Threatened Species Scientific Committee 2016). The understorey of the community typically contains a high to very high diversity of shrub and herb species that often vary from patch to patch (Threatened Species Scientific Committee 2016). The application area contains vegetation communities (namely BaHhBm and BaBm – see section 2) that share characteristics with the description of the *Banksia* woodlands TEC.

During the detailed flora and vegetation assessment, the *Banksia* Woodland TEC was recorded within the survey area. The Assessment incorporated a comprehensive assessment for determining the presence of this TEC, which was applied to three patches of *Banksia* Woodland within the application area. The Assessment noted that the total extent of *Banksia* Woodland TEC within the application area is 1.06 hectares (MRIA 2017).

Given that the proposed clearing will impact on approximately 1.06 hectares of native vegetation that is considered to be an occurrence of the *Banksia* Woodland TEC, the proposed clearing is at variance to this Principle.

Taking into account the applicant's avoidance and minimisation measures, it is considered that the applicants proposed offset will counterbalance the residual impact to *Banksia* Woodlands TEC. Section 6 provides further information on these matters.

**(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.**

**Comments Proposed clearing may be at variance to this Principle**

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 percent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia 2001). Within constrained areas on the Swan Coastal Plain, the target for representation of the pre-clearing extent of a particular native vegetation complex is 10 per cent (EPA 2006). The application area is zoned as 'Primary regional roads' within the Metropolitan Region Scheme and is therefore located within a constrained area.

The local area (10 kilometre radius) retains approximately 18.72 per cent native vegetation cover (9,881 hectares). The application area represents approximately 0.025 per cent of the remaining native vegetation within the local area, and the proposed clearing would reduce the extent of native vegetation within the local area to 9,878.54 hectares.

As indicated in Table 2, the vegetation extents applicable to the application area are greater than the recommended 10 per cent threshold for constrained areas. Therefore the application area is not considered to be located in an extensively cleared area.

Noting that the application area contains vegetation in a very good (Keighery 1994) condition, comprises a high level of biological diversity, contains significant habitat for conservation significant fauna, and will impact on wetlands and a TEC, the application area is considered to be a significant remnant.

Given the above, the proposed clearing may be at variance to this Principle.

**Table 2: Vegetation Extents**

	Pre-European	Current Extent	Remaining	Extent in DBCA Managed Lands	Current Extent in All DPaW-Managed Land (proportion of Current Extent) (%)
<b>IBRA Bioregion*</b>					
Swan Coastal Plain	1,501,222	578,997	39	-	15
<b>Swan Coastal Plain – Vegetation Complexes**</b>					
Bassendean Complex-Central And\South:	87, 476	25 533	27	5	-
Southern River Complex:	58,781	10,828	18	2	-

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

**Comments Proposed clearing is at variance to this Principle**

According to available databases, the application area intersects two resource enhancement sumplands (UFI 15297 and UFI 7215) and occurs within 50 metres of two conservation category sumplands. The application area is also adjacent to two multiple use sumplands and a multiple use dampland.

Conservation category wetlands are the highest priority wetlands which support a high level of ecological attributes and functions. Resource enhancement wetlands may have been partially modified but still support substantial ecological attributes and functions; and multiple use wetlands have few important ecological attributes and functions remaining (Water and Rivers Commission 2001).

The two areas that intersect the mapped resource enhancement wetlands comprise approximately 0.217 hectares. The Assessment identified one wetland vegetation type (MpKgLS, *Melaleuca preissiana* low open forest - see Section 2) within the application area (comprising 0.52 hectares), representing the abovementioned resource enhancement sumpland (UFI 15297) (MRIA 2017). The larger mapped wetland area comprises approximately 211.8 hectares. The vegetation type is restricted to immediately south of Armadale Road, west of Liddelow Road. The Assessment notes that both locations were historically cleared and significantly burnt in the past with the present vegetation representing regrowth from approximately 1995, which has resulted in dense colonising species such as *Kunzea glabrescens* and weeds (*Ehrharta calycina*) (MRIA 2017). The vegetation within this 0.52 hectare area of wetland vegetation was recorded to be in a good to degraded (Keighery 1994) condition (MRIA 2017).

The proposed clearing also occurs within 50 metres of two conservation category wetland areas along the alignment. Noting that EPA guidance recommends that conservation category wetlands are afforded a minimum 50 metre buffer, wetland areas without an appropriate buffer may be subject to degrading processes and values may be reduced. For example, weeds and rubbish may encroach into wetland areas that are currently being buffered by the existing roadside vegetation. Considerations should therefore be given to opportunities to mitigate impacts of the clearing and road upgrade on adjacent wetlands through the establishment of native vegetation adjacent to the affected wetland.

Given the above, the proposed clearing will impact upon 0.52 hectares of vegetation growing within and in association with a wetland. Therefore, the proposed clearing is at variance to this Principle. Considering the accumulation of wetland impacts under Clearing Permit CPS 7623/1, this being 3.26 hectares of vegetation growing in association with a wetland, the proposed clearing is considered significant.

Potential hydrological impacts to wetlands can be managed through the installation of drainage structures, complementing the existing Armadale Road alignment. The applicant has advised that drainage features will be included in project design to prevent degradation to surface and underground water resources (MRIA 2017).

Taking into account the applicant's avoidance and minimisation measures, it is considered that the applicants proposed offset will counterbalance residual impacts to the wetland. Section 6 provides further information on these matters.

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

**Comments Proposed clearing is not likely to be at variance to this Principle**

The application area occurs within three soil subsystems mapped by the former Department of Agriculture and Food Western Australia (DAFWA) [now Department of Primary Industries and Regional Development] (DAFWA 2017):



- Bassendean B1 Phase – Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 metres;
- 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 1-2 metres; and
- Bassendean B3 Phase – Closed depressions and poorly defined stream channels with moderately deep, poorly to very poorly drained bleached sands with an iron-organic pan, or clay subsoil. Surfaces are dark grey sand or sandy loam.

The majority of the application area is mapped as either the B1 or B2 Phase map units.

DAFWA mapping indicates that greater than 70 per cent of the B1 and B2 soils systems have a high to extreme wind erosion risk (highest risk rating out of six risk categories). DAFWA mapping indicates that 30-50 per cent of the three above mentioned soil systems have a moderate to high salinity risk or is presently saline, however groundwater salinity within the application area is mapped as less than 500 milligrams per litre total dissolved solids, and salinity is unlikely to be an issue.

While the soils mapped within the application area are recognised as having a high risk of wind erosion, noting that the application area is fragmented, comprises 2.08 hectares across a distance of approximately six kilometres, and includes portions that are in a degraded and completely degraded condition, the proposed clearing is not likely to result in appreciable land degradation via wind erosion.

The applicant has advised that during construction cleared areas and all open ground will be managed to prevent dust lift through the use of water carts and longer term dust suppressants, which will assist in minimising the potential for wind erosion (MRWA 2018).

The applicant also advised that post construction, exposed earthworks will be stabilised through the application of mulch and planting of landscaping, whereby mulch provides initial stabilisation of earth batters until the landscaping matures and the plant roots stabilise the earthworks. The applicant also noted that there will be a limited time that cleared areas will be left open prior to construction commencing (MRWA 2018).

Given the above, the proposed clearing is not likely to be at variance to this principle.

**(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.**

**Comments Proposed clearing is at variance to this Principle**

The application area intersects two Bush Forever (BF) sites, which comprise a total of 0.60 hectares. Approximately 0.03 hectares comprises BF site 344 (Gibbs Road Swamp Bushland, Banjup/Forrestdale) and approximately 0.57 hectares comprises BF site 390 (Fraser Road Bushland, Banjup). The application area includes approximately 0.52 hectares of native vegetation within Crown Reserve 1820 (known as Rose Shanks Reserve – also contained within the larger BF site 390) and approximately 0.02 hectares of native vegetation within Crown Reserve 8129, with both reserves included within the larger Jandakot Regional Park.

The majority of the application area that occurs within Rose Shanks Reserve was recorded as being an occurrence of the Banksia Woodlands TEC (MRIA 2017)

DBCA provided comment on the proposed clearing with respect to impacts to Jandakot Regional Park and advised that "The main protection that Jandakot Regional Park has is by virtue of its Parks and Recreation reservation and its inclusion in Bush Forever (2000). Potential impacts that the proposed clearing would have on the environmental attributes of Jandakot Regional Park are no different to the predicted impacts to Bush Forever sites. *State Planning Policy (SPP) 2.8 – Bushland Policy for the Perth Metropolitan Region (2010)* requires proposals within Bush Forever areas to ensure that all reasonable steps have been taken to avoid, minimise or offset any likely adverse impacts on regionally significant bushland, so while the Regional Parks Unit does not support clearing within Jandakot Regional Park, if the Bush Forever impacts have been addressed through appropriate offsets this should be sufficient" (DBCA 2017).

Given the above, the proposed clearing will impact on 0.6 hectares of native vegetation within bush forever sites and 0.54 hectares of native vegetation managed within the larger Jandakot Regional Park, 0.52 hectares of which is considered to be an occurrence of the Banksia Woodlands TEC. The proposed clearing may also indirectly impact on these conservation areas through the potential introduction and spread of weeds and dieback.

Given the above, the proposed clearing is at variance to this Principle. Considered the accumulation of impacts to conservation areas under Clearing Permit CPS 7623/1, this being 0.99 hectares of native vegetation within bush forever sites and 0.24 hectares of native vegetation managed within the larger Jandakot Regional Park, the proposed clearing is considered significant.

As discussed under principle (a), mechanical clearing increases the risk of spreading weeds and dieback into native vegetation adjacent to the application area. Weed and Dieback management measures will mitigate the impacts of the introduction and spread of weeds.

It is considered that the applicants proposed offset for impacts to a biodiversity will address impacts to Jandakot Regional Park and Bush Forever sites. Section 6 provides further information on these matters.

**(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.**

**Comments**

**Proposed clearing is at variance to this Principle**

As discussed under Principle (f), the application area intersects two resource enhancement sumplands (UFI 15297 and UFI 7215) and occurs within 50 metres of two conservation category sumplands. The application area is also adjacent to two multiple use sumplands and a multiple use dampland.

The Assessment identified one wetland vegetation type (MpKgLS, *Melaleuca preissiana* low open forest - see Section 2) within the application area (comprising 0.52 hectares), representing the abovementioned resource enhancement wetland (UFI 15297) (MRIA 2017). The larger mapped wetland area comprises 211.8 hectares.

Given that the application area comprises 0.52 hectares of riparian vegetation (MRIA 2017) that is considered to be growing in association with a resource enhancement sumpland, the proposed clearing is likely to increase turbidity and sedimentation and is likely to cause deterioration in the quality of surface water within the sumpland.

Groundwater salinity within the application area is mapped as less than 500 milligrams per litre total dissolved solids. Noting this low salinity level, and the relatively small, linear, fragmented application area, the proposed clearing is unlikely to result in a perceptible rise in the water table and thus significant changes to groundwater or surface water quality via salinity are unlikely.

Based on the above, it is considered that the proposed clearing is likely to cause deterioration in the quality of surface water and the proposed clearing is at variance to this Principle.

The applicant advised that the existing Armadale Road includes drainage structures and engineered water management strategies to avoid impacts on the quality of surface and groundwater. The applicant advised that additional drainage features will be included in the project design to prevent degradation to surface and underground water resources (MRIA 2017).

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

**Comments**

**Proposed clearing is not likely to be at variance to this Principle**

The application area is located within a moderate rainfall area, where the average rainfall is 900 millimetres per annum.

While the application area intersects two mapped resource enhancement sumplands, based on the moderate rainfall, that the majority of the application area contains well-draining soil types and noting the linearity of the application area, which contains fragmented portions over approximately 6.1 kilometres, it is considered that the proposed clearing is not likely to cause, or exacerbate the incidence or intensity of flooding.

Given the above, the proposed clearing is not likely to be at variance to this Principle.

**Planning instruments and other relevant matters.**

**Comments**

The applicant has advised that the duplication and improvement of Armadale Road will assist in relieving congestion along the existing corridor, which currently experiences breakdown flow in the peak periods. The proposed upgrade project will include the duplication of Armadale Road between Tapper Road and Anstey Road, improvement and upgrade of various intersections, and associated works including lighting, service relocations and drainage (MRIA 2017).

The clearing permit application was advertised on DWER's website on 16 March 2018, for a 21 day public submission period. No submissions have been received in relation to this application.

On 22 August 2017, the Commonwealth DotEE determined that the duplication of approximately seven kilometres of Armadale road (EPBC 2017/7972) is not a controlled action (DotEE 2017).

There are two Aboriginal Sites of Significance mapped within the application area, being; Banjup: Calsil, and Readymix Sandpit 1. It is the applicant's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

The application area is predominantly zoned as 'Primary regional roads' within the Metropolitan Region Scheme.

The application area is mapped within the Perth and Jandakot groundwater area which are areas proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act).

DWER's Peel Region advised that any groundwater abstraction in these proclaimed areas will require a licence under section 26D (construct a well) and Section 5C (groundwater abstraction) of the RIWI Act. Water availability for dust suppression will depend upon which groundwater area will be accessed and the applicant is encouraged to contact the Business Support Unit for licensing advice on 1800 508 885 (DWER 2018).

The application area is located within the Jandakot Underground Water Pollution Catchment Area (UWPCA) and is managed in accordance with the Western Australian Planning Commission's (WAPC) Statement of Planning Policy No 2.3 *Jandakot groundwater protection policy* (SPP 2.3) and the Water Quality Protection Note (WQPN 25) *Land use compatibility table for public drinking water source areas*. Under WQPN 25, road infrastructure is a compatible use for Priority 1 and 2 areas. The applicant is encouraged to act in accordance with best management practices which can be found here: [http://www.water.wa.gov.au/data/assets/pdf\\_file/0014/1733/12441.pdf](http://www.water.wa.gov.au/data/assets/pdf_file/0014/1733/12441.pdf).

DBCA provided comment on the proposed clearing and recommended "the preparation and implementation of a Construction Environmental Management Plan. The plan is to address issues such as protection of remnant vegetation where possible; rehabilitation of the edges of the road reserve (a gentle sloping batter) with local native species; weed, disease and access control. Existing infrastructure such as fences and gates will need to be replaced and new deposited plans for the affected lots will need to be provided. Should clearing be approved, Regional Parks Unit (RPU) expects that the boundaries are properly pegged prior to clearing" (DBCA 2017).

The City of Cockburn (2018) provided comment on the proposed clearing and advised that it "has no objection to the clearing of 2.46 hectares of native vegetation within various properties and road reserves within the localities of Forrestdale and Banjup, for the purpose of constructing a second carriageway on Armadale Road as per Clearing Permit CPS 7623/1. The City trusts that appropriate offsets will be required" (City of Cockburn 2018).

The City of Armadale (2018) provided comment on the proposed clearing and advised that "the City's environmental services Team would ask that the following aspects are undertaken should Main Roads' clearing application be successful:

- Vegetation salvage is undertaken wherever possible i.e. Grasstree, Macrozamia etc.
- Prior to clearing vegetation should be checked for nesting fauna (this should include checking tree hollows.
- Where it is apparent that a felled tree contains a nesting hollow, efforts should be made to salvage that hollow for future instalment in a suitable environment.
- Cleared vegetation should not negatively impact on remnant vegetation to be retained i.e. cleared material should not be pushed in to other remnant areas".

## 5. Applicant's Submissions

On 18 May 2018 the applicant was formally notified by DWER (via letter) of the environmental issues associated with the proposed clearing. DWER's letter acknowledged MRWA's initial offset which incorporated the monetary offset described in Section 6 below. DWER's letter noted that a further offset would likely be required to address impacts to riparian vegetation, and requested additional information regarding how the applicant had avoided and minimised environmental impacts.

On 25 May 2018 the applicant emailed DWER in response to the letter of 18 May 2018 and provided the following:

- An Offset Proposal to address impacts to wetlands; and
- A summary of environmental impact avoidance and mitigation measures.

The proposed offset to address impacts to riparian vegetation was subsequently reviewed by DWER and determined as being adequate to offset the residual significant impacts associated with the proposed clearing (see section 6 below).

## 6. Suitability of Proposed offset

**Comments** Principle 1 of the *WA Environmental Offsets Policy September 2011* outlines that environmental offsets will only be considered after avoidance and mitigation options have been pursued. The *WA Environmental Offsets Guidelines August 2014* outlines a four step mitigation hierarchy; avoid, minimise, rehabilitate and offset.

The avoidance and mitigation measures assessed within section 3 are deemed to be adequate in addressing this requirement. It is noted that the road will provide a public benefit including improved road safety.

The assessment against the clearing principles identified that the proposed clearing is at variance to principle: (a), (b), (d), (f), (h) and (i). After consideration of the proposed avoidance, minimisation and mitigation measures the Delegated Officer determined that the proposed clearing will result in the following significant residual impacts

- Loss of native vegetation that provides a high level of biological diversity;
- loss of up to 2.08 hectares of vegetation that comprises of black cockatoo foraging habitat;
- loss of quenda (*Isodon obesulus* subsp. *fusciventer*) habitat;
- loss of up to 1.06 hectares of the *Banksia* Woodlands of the Swan Coastal Plain TEC; and
- loss of up to 0.52 hectares of wetland vegetation.

To offset the significant residual impacts, the applicant proposed a monetary contribution of \$74,436 for the acquisition of 7.73 hectares of remnant native vegetation for conservation, which comprises high biodiversity, black cockatoo foraging habitat, quenda habitat and the *Banksia* Woodlands of the Swan Coastal Plain TEC. The monetary contribution figure is based on current estimated per hectare vegetated land values.

The applicant also proposed to offset the loss of 0.52 hectares of wetland vegetation through the acquisition of 1.47 hectares of wetland vegetation within Lot 842, Carabungup Road, Nirimba. The land proposed for conservation is a resource enhancement wetland adjacent to the Austin Bay Nature Reserve.

In assessing whether the proposed offsets are adequately proportionate to the significance of the values being impacted, DWER undertook a calculation using the Commonwealth Offsets Assessment Guide. The calculation indicated that the allocation of 7.37 hectares (to address impacts to biodiversity, black cockatoo foraging habitat and quenda habitat) and 1.47 hectares (to address impacts to a resource enhancement wetland) is adequate to counterbalance the significant residual impacts.

Given the above, a monetary contribution of \$74,436 for the acquisition of 7.37 hectares of native vegetation for conservation, and the proposed conservation of 1.47 hectares of wetland vegetation, is considered adequate to counterbalance the remaining significant residual impacts of the proposed clearing consistent with the *WA Environmental Offsets Policy September 2011*.

## 7. References

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