



## CLEARING PERMIT

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

<b>Purpose Permit number:</b>	CPS 7227/1
<b>Permit Holder:</b>	Commissioner of Main Roads Western Australia
<b>Duration of Permit:</b>	11 August 2017 to 11 August 2022

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

### PART I – CLEARING AUTHORISED

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

Clearing for the purpose of improving road safety.

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

ROAD RESERVE (PINS 1355494, 1323445, 1323437, 11081516, 11081525, 11081599, 11081598, 11433194, 1355493, 1323378), NARROGIN  
ROAD RESERVE (PINS 11527786, 11554009, 11554008, 11709276, 11544897, 11745735, 11480416), MINIGIN  
ROAD RESERVE (PINS 11554007, 11554002, 11544903, 11544911, 11544908), DUMBERNING  
ROAD RESERVE (PINS 11616602, 11616601, 11476885, 11328918, 11616607, 11616606, 11328988, 11616604, 11616603, 11466763, 11328944, 11328949, 11328993, 11328991, 11491727, 11437579, 11616391, 11328974, 11437574, 11437584, 11328972, 11328973, 11477892, 11266320, 11266309, 11266308, 11266318, 11272082, 11272085, 11272086, 11322078, 11329979, 11322080, 11334601, 11334600, 11329996, 11331572, 11331573, 11329977, 11322964, 11331575, 11322966), WILLIAMS  
ROAD RESERVE (PINS 11721028, 11771584, 11771583, 11771582, 11752891, 11752892, 11752893, 11752888), MUMBERKINE  
ROAD RESERVE (PINS 11752882, 11535361, 11535360, 11404371, 11535362), WONGAMINE  
ROAD RESERVE (PINS 11393928, 11393927, 11393926, 11783081, 11407194, 11407195, 1295573, 11407196, 11536015), NUNILE  
ROAD RESERVE (PINS 11429941, 11731749), GOOMALLING  
ROAD RESERVE (PINS 11721031, 11719730, 11719733), HULONGINE  
ROAD RESERVE (PINS 11719737, 11720943), ROSSMORE  
ROAD RESERVE (PIN 11752883), JENNACUBBINE  
ROAD RESERVE (PINS 11783080, 11405591, 11407197), DUMBARTON  
ROAD RESERVE (PINS 11438544, 11438518), TOODYAY  
LOT 1630 ON PLAN 187584, NARROGIN  
CROWN RESERVE 12089, MINIGIN  
LOT 301 ON PLAN 44265, DUMBERNING  
LOT 300 ON PLAN 44265, DUMBERNING  
UNALLOCATED CROWN LAND, WILLIAMS  
CLOSED ROAD, WILLIAMS  
RAILWAY RESERVE, WILLIAMS  
LOT 9366 ON PLAN 233557, WILLIAMS  
LOT 56 ON PLAN 2724, WILLIAMS

LOT 55 ON PLAN 2724, WILLIAMS  
LOT 12776 ON PLAN 147180, WILLIAMS  
LOT 250 ON DIAGRAM 2613, WILLIAMS  
LOT 15042 ON PLAN 250985, MUMBERKINE  
LOT 11952 ON PLAN 132100, MUMBERKINE  
LOT 1146 ON PLAN 224210, MUMBERKINE  
LOT 111 ON PLAN 300065, MUMBERKINE  
LOT 24 ON PLAN 18361, WONGAMINE  
LOT 401 ON PLAN 55342, NUNILE

**3. Area of Clearing**

- (a) The Permit Holder must not clear more than 6.4 hectares of native vegetation along Toodyay-Goomalling Road reserve (M060) SLK 1.2-48.0; and
- (b) The Permit Holder must not clear more than 6.51 hectares of native vegetation along Pinjarra-Williams Road reserve (M053) SLK 91.9-125.5; and
- (c) The Permit Holder must not clear more than 5.25 hectares of native vegetation along Williams-Kondinin (Narrogin) Road reserve (H053) SLK 0-31.4.

**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 project 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 project activities under the *Main Roads Act 1930* or any other written law.

**PART II – MANAGEMENT CONDITIONS**

**7. Avoid, minimise etc 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.

**8. Weed control**

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

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no *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.

**9. Offset – monetary contribution**

(a) Prior to undertaking any clearing authorised under this Permit along Toodyay-Goomalling Road the Permit Holder must:

- (i) request the Department to raise an invoice for the amount of A\$143,552.80; and
- (ii) pay the account in full;

(b) Prior to undertaking any clearing authorised under this Permit along Pinjarra-Williams Road the Permit Holder must:

- (i) request the Department to raise an invoice for the amount of A\$126,630.00; and
- (ii) pay the account in full;

- (c) Prior to undertaking any clearing authorised under this Permit along Williams-Kondinin (Narrogin) Road the Permit Holder must:
- (i) request the Department to raise an invoice for the amount of A\$88,515.20; and
  - (ii) pay the account in full;
- (d) Prior to 30 June 2021, the Permit Holder must:
- (i) request that the Department raises all invoices referred to under condition 9a-c, if not already done; and
  - (ii) pay all invoices referred to under condition 9d(i) in full, if not already done.

### **PART III - RECORD KEEPING AND REPORTING**

#### **10. Records to be kept**

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

- (a) the date clearing commenced along Toodyay-Goomalling Road;
- (b) the date clearing commenced along Pinjarra-Williams Road; and
- (c) the date clearing commenced along Williams- Kondinin (Narrogin) Road.

#### **11. Reporting**

Within one week of the clearing commencing along each road, the Permit Holder must provide to the Department the relevant records outlined in condition 10.

### **DEFINITIONS**

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

*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;

*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 Parks and Wildlife Regional Weed Rankings Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.

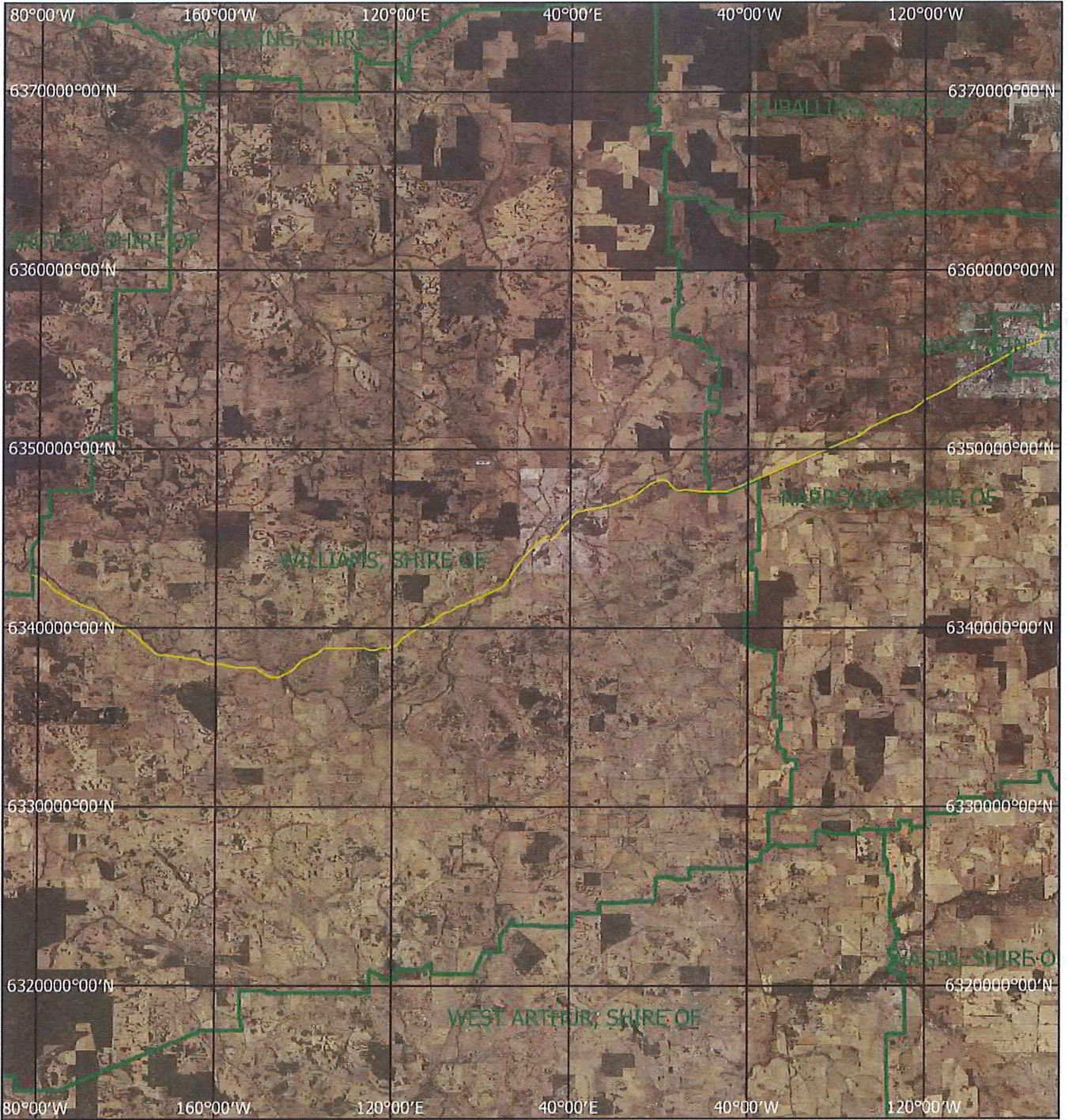


Kelly Faulkner  
EXECUTIVE DIRECTOR  
REGULATORY SERVICES (ENVIRONMENT)

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

11 July 2017

# Map 7227/1a



## Legend

- Roads
- LGA
- Cadastre
- Virtual Mosaic (LGATE-V001)
- Areas approved to clear



1:386,138

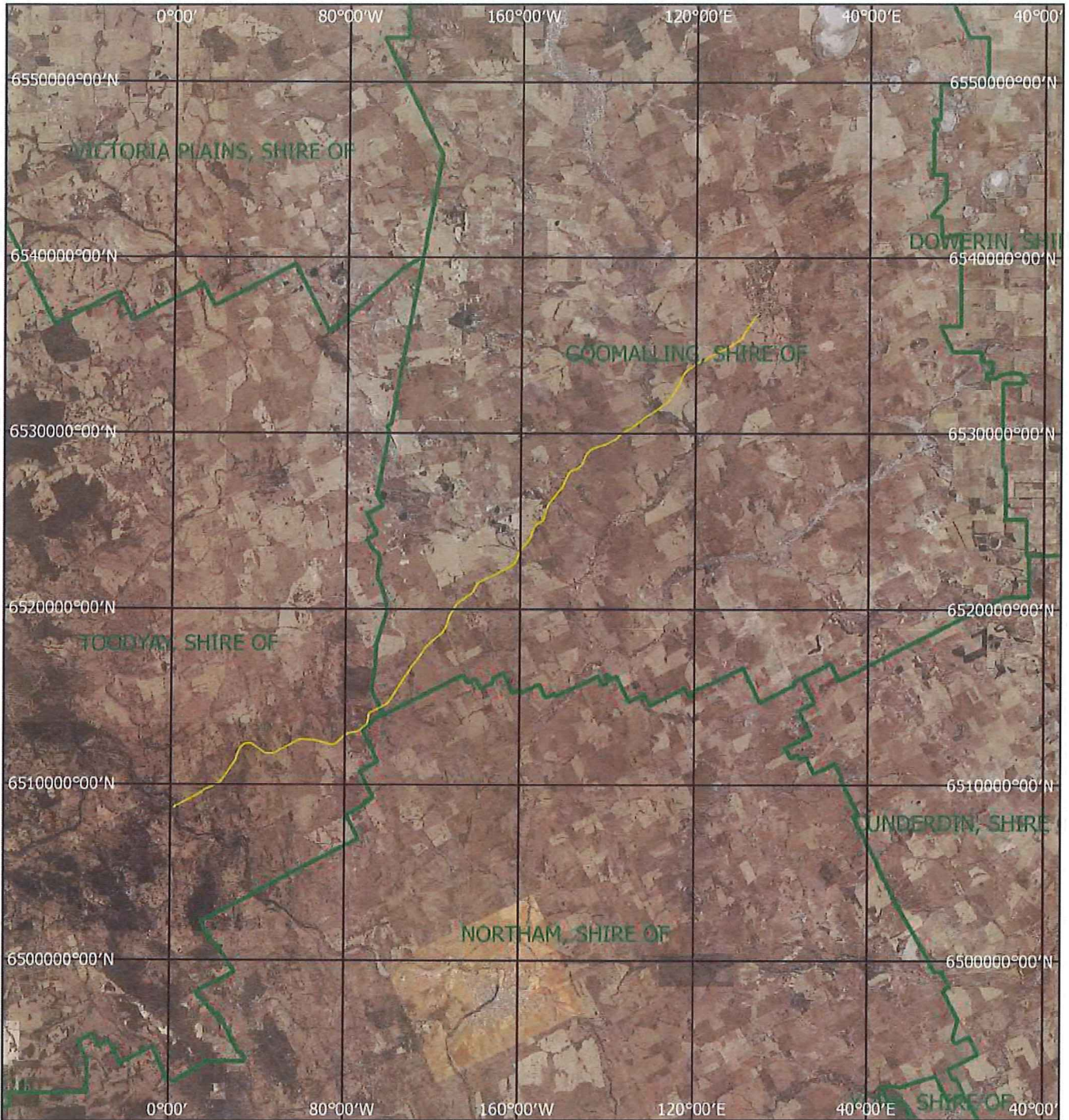
MGA 94  
Geocentric Datum of Australia 1994

*[Signature]* Date 11/7/17

Officer with delegated authority under Section 20  
of the Environmental Protection Act 1986



# Map 7227/1b



## Legend

- Roads
- LGA
- Cadastre
- Virtual Mosaic (LGATE-V001)
- Areas approved to clear



1:386,138

MGA 94  
Geocentric Datum of Australia 1994

*[Signature]*  
Date: 11/2/17

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.: CPS 7227/1  
Permit type: Purpose Permit

### 1.2. Applicant details

Applicant's name: Commissioner of Main Roads Western Australia

### 1.3. Property details

Property:  
ROAD RESERVE (PINS 1355494, 1323445, 1323437, 11081516, 11081525, 11081599, 11081598, 11433194, 1355493, 1323378), NARROGIN  
ROAD RESERVE (PINS 11527786, 11554009, 11554008, 11709276, 11544897, 11745735, 11480416), MINIGIN  
ROAD RESERVE (PINS 11554007, 11554002, 11544903, 11544911, 11544908), DUMBERNING  
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Local Government Authority: Shire of Goomalling  
Shire of Narrogin  
Town of Narrogin  
Shire of Toodyay  
Shire of Williams

### 1.4. Application

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

### 1.5. Decision on application

Decision on Permit Application: Grant

Decision Date: 11 July 2017

**Reasons for Decision:**

The clearing application, received on 11 August 2016, has been assessed against the clearing principles, planning instruments and other matters in accordance with s51O of the *Environmental Protection Act 1986*, and has concluded that the proposed clearing is at variance to principles (a), (b), (d), (e) and (f), may be at variance to principle (h) and is not likely to be at variance to the remaining clearing principles.

Through assessment it has been determined that;

- The application area contains approximately 16.509 hectares of vegetation in 'Good' or better condition which comprises significant foraging habitat for Carnaby's cockatoo (*Calyptorhynchus latirostris*) and forest red-tailed black cockatoo (*Calyptorhynchus banksii subsp. naso*) as well as potential breeding habitat for these species, and suitable habitat for the red-tailed phascogale (*Phascogale calura*). These species are listed as rare or likely to become extinct under the *Wildlife Conservation Act 1950* (WC Act) and have been given the status of endangered or vulnerable under the EPBC Act.
- The application area contains approximately 0.32 hectares of the threatened ecological community (TEC) 'Eucalypt woodlands of the Western Australian Wheatbelt', listed as critically endangered under the EPBC Act. Surrounding this extent, the application area is also likely to be necessary for the maintenance of this TEC.
- The application area is located in an area that has been extensively cleared. The local area (10 kilometre radius) retains between 10-15 per cent native vegetation cover. All of the mapped Beard vegetation associations (with the exception of one) retain less than 30 per cent of their pre-European extents within the Avon Wheatbelt and Jarrah Forest Interim Biogeographic Regionalisation of Australia bioregions, where 30 per cent is the Commonwealth recommended threshold for representation. The application area contains approximately 16.509 hectares of vegetation in 'Good' or better condition.
- The application area may be necessary for the continued existence of rare flora. The rare flora species *Pultenaea pauciflora*, listed as threatened under the WC Act and vulnerable under the EPBC Act, occurs in wandoo (*Eucalyptus wandoo*) open forest in the maintenance zone adjacent to the application area along the Williams-Kondinin (Narrogin) Road reserve. Approximately 0.11 hectares of suitable habitat for this species occurs within the application area.
- The proposed clearing may impact on the environmental values of adjacent and nearby conservation areas through fragmentation of linkages and spread of weeds. The application area is located adjacent to vegetation contiguous with a *Conservation and Land Management Act 1984* section 5(1)(g) reserve and a Land for Wildlife site, and is in close proximity to a further three nature reserves and four Land for Wildlife sites.
- The application area is likely to facilitate landscape connectivity and contribute to fauna dispersal between larger isolated bushland fragments in an extensively cleared landscape. The proposed clearing may cause a decline in the effectiveness of the linkage, contributing towards landscape fragmentation and limitations in fauna dispersal. However, it is noted that the proposed clearing does not include the entire width of roadside vegetation.

The Delegated Officer has considered the purpose for clearing (being for public works) and notes Main Roads WA's proposed measures to avoid and mitigate impacts, including limiting clearing to four metres from the existing sealed road, and surveying habitat trees. Despite these measures, the Delegated Officer is of the view that significant residual environmental impacts remain and in accordance with the Western Australian Offsets Policy (2011), must be offset.

The Delegated Officer considered the quantification of the offset required in accordance with the Department of the Environment and Energy's Environmental Offset Calculator and Offset Assessment Guide. The conversion of the spatial area (131 hectares) into a monetary contribution was calculated to be \$358,698, based on the 2015 per-hectare vegetated land value for parcels of land within the Shires of Toodyay, Goomalling, Narrogin and Williams. Main Roads WA agree to contribute \$358,698 to the Environmental Offsets Fund for the purpose of purchasing conservation land.

As such, the Delegated Officer is satisfied that the environmental impacts associated with this project have been appropriately avoided, minimised, mitigated and the significant residual impacts offset. The Delegated Officer has therefore decided, to grant this clearing permit.

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

##### Vegetation Description

The application area is mapped Beard vegetation associations (Shepherd et al., 2001):

- 4: Medium woodland; märi (*Corymbia calophylla*) and wandoo (*Eucalyptus wandoo*);
- 7: Medium woodland; York gum (*Eucalyptus loxophleba*) and wandoo;
- 352: Medium woodland; York gum;
- 946: Medium woodland; wandoo;
- 947: Medium woodland; powderbark wandoo (*Eucalyptus accedens*) and mallet (*Eucalyptus* spp.);
- 1023: Medium woodland; York gum, wandoo and salmon gum (*Eucalyptus salmonophloia*); and
- 1049: Medium woodland; wandoo, York gum, salmon gum, morrel (*Eucalyptus* spp.) and gimlet (*Eucalyptus salubris*).

##### Clearing Description

The proposed clearing of a total of 18.16 hectares along Toodyay–Goomalling Road (6.4 hectares), Pinjarra–Williams Road (6.51 hectares) and Williams–Kondinin (Narrogin) Road (5.25 hectares) is for the purpose of widening the maintenance zone to improve road safety

##### Vegetation Condition

Excellent; Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994).

To

Completely Degraded; No longer intact; completely/almost completely without native species (Keighery, 1994).

##### Comment

The condition of the vegetation under application was established through a November 2015 and February 2016 flora and fauna survey conducted by GHD (GHD, 2016a).

## 3. 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

Main Roads Western Australia (MRWA; the applicant) proposed to clear a total of 18.16 hectares of native vegetation within three road reserves for the purpose of widening the maintenance zone to improve road safety along the Toodyay-Goomalling Road (M060) SLK 1.2-48.0, Pinjarra-Williams Road (M053) SLK 91.9-125.5 and Williams-Kondinin (Narrogin) Road (H053) SLK 0-31.4

GHD conducted a flora survey, fauna survey and undertook mapping of the vegetation types and conditions within the application area and surrounding road reserves (GHD, 2016a; GHD, 2016b). Vegetation condition was rated according to Keighery (1994), and the breakdown of vegetation types and conditions within each road reserve surveyed are provided in Appendix 1.

#### Toodyay-Goomalling Road reserve

- 6.4 hectare portion of application area, located within the Shire of Toodyay and Shire of Goomalling.
- The GHD survey recorded 146 flora taxa and 64 fauna taxa within this portion of the application area (GHD, 2016a).
- The GHD survey mapped 91.3 per cent (5.841 hectares) of this portion of the application area as containing vegetation in 'Good' or better condition (GHD, 2016a).

#### Pinjarra-Williams Road reserve

- 6.51 hectare portion of the application area, located within the Shire of Williams.
- The GHD survey recorded 102 flora taxa and 69 fauna taxa within this portion of the application area (GHD, 2016a).
- The GHD survey mapped 97.4 per cent (6.333 hectares) of this portion of the application area as containing vegetation in 'Good' or better condition (GHD, 2016a).

#### Williams-Kondinin (Narrogin) Road reserve

- 5.25 hectare portion of the application area, located within the Shire of Williams and Shire of Narrogin.
- The GHD survey recorded 129 flora taxa and 55 fauna taxa within this portion of the application area (GHD, 2016a).
- The GHD survey mapped 82.5 per cent (4.33 hectares) of this portion of the application area as containing vegetation in 'Good' or better condition (GHD, 2016a).

The local area considered in the assessment of the application is defined as a 10 kilometre radius measured from the perimeter of the application area.

Eight priority flora have been recorded within the local area. One Priority 3 flora species occurs adjacent to the application area within the Pinjarra-Williams Road reserve (GHD, 2016a).

Of the recorded conservation significant fauna species (refer to Principle (b)), the application area may contain significant habitat for four of these species. The proposed clearing will impact 18.16 hectares of black cockatoo foraging habitat, 181 potential black cockatoo nesting trees, and 18.16 hectares of suitable habitat for the red-tailed phascogale (GHD, 2016a).

Of the recorded rare flora species (refer to Principle (c)), one rare flora species occurs adjacent to the application area within the Williams-Kondinin (Narrogin) Road reserve (GHD, 2016a).



According to the GHD surveys and advice received from the Department of Parks and Wildlife (Parks and Wildlife), approximately 0.32 hectares of the application area contains vegetation consistent with a Commonwealth listed threatened ecological community (TEC) 'Eucalypt Woodlands of Western Australian Wheatbelt' listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (refer to Principle (d)) (GHD, 2016a; GHD, 2016b; Parks and Wildlife, 2016b).

Noting that the application area contains significant habitat for fauna including species of conservation significance, suitable habitat for rare and priority flora species, and a TEC, the application area contains a high level of biodiversity. The proposed clearing is at variance to this Principle.

- Methodology**    References:
- Department of Parks and Wildlife (2016b)
  - GHD (2016a)
  - GHD (2016b)
  - Government of Western Australia (2015)
  - Keighery (1994)
  - Northcote et al. (1960-68)
  - Parks and Wildlife (2016b)
  - Schoknecht et al. (2004)
- GIS Databases
- SAC Bio datasets (September 2016)
  - Pre-European vegetation

**(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**

The GHD survey recorded a diversity of flora, vegetation types and indigenous fauna within the application area and surrounding road reserves (GHD, 2016a; GHD, 2016b). Some of the fauna species observed within the application area include the common brush-tail possum (*Trichosurus vulpecula*), dunnart (*Sminthopsis* sp.), Euro (*Macropus robustus*), echidna (*Tachyglossus aculeatus*), bobtail (*Tiliqua rugosa*) and Gould's monitor (*Varanus gouldii*) (GHD, 2016a; GHD, 2016b).

According to available databases, 11 conservation significant fauna species have been recorded within the local area (10 kilometre radius) of the proposed clearing areas (Parks and Wildlife, 2007-). Four of these species were recorded within the application area (GHD, 2016a).

**Toodyay-Goomalling Road reserve**

- Rainbow bee-eater (*Merops ornatus*; listed as migratory under the EPBC Act).

**Pinjarra-Williams Road reserve**

- Carnaby's cockatoo (*Calyptorhynchus latirostris*; listed as endangered under the EPBC Act).
- Forest red-tailed black cockatoo (*Calyptorhynchus banksia* subsp. *naso*; listed as vulnerable under the EPBC Act).
- Red-tailed phascogale (*Phascogale calura*; listed as endangered under the EPBC Act) from a small patch of *Allocasuarina* shrubland.
- Rainbow bee-eater.

**Williams-Kondinin (Narrogin) Road reserve**

- Carnaby's cockatoo.
- Forest red-tailed black cockatoo.

The red-tailed phascogale inhabits wandoo and sheoak (*Allocasuarina huegeliana*) woodland associations, with populations being most dense in the latter vegetation type, and has a preference for long unburnt habitat with a continuous canopy, as well as tree hollows (DEC 2012). Wandoo trees provide excellent nesting sites in the form of hollow logs and limbs, which they line with grass and feathers (DEC 2012). Nest sites occur in highly flammable areas, and may often be in dead sheoaks, skirts of live (or stumps of dead) grass trees (*Xanthorrhoea* spp.) (DEC 2012). Noting the mapped vegetation types and the condition of the vegetation within the application area, approximately 16.509 hectares of the application area contains vegetation in 'Good' or better condition which is likely to comprise suitable habitat for this species.

Black cockatoos breed in large hollow-bearing trees, generally within woodlands or forests or in isolated trees (Commonwealth of Australia, 2012). These species nest in hollows in live or dead trees of karri (*Eucalyptus diversicolor*), marri, wandoo, tuart (*Eucalyptus gomphocephala*), salmon gum, jarrah, flooded gum (*Eucalyptus rudis*), York gum, powderbark wandoo, bullich (*Eucalyptus megacarpa*) and blackbutt (*Eucalyptus* spp.) (Commonwealth of Australia, 2012).

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 approximately 16.509 hectares of vegetation in 'Good' or better condition which comprises foraging habitat for black cockatoos (GHD, 2016a;

GHD, 2016b):

- 6.4 hectares of foraging habitat and 67 potential nesting trees along the Toodyay-Goomalling road reserve, including 10 trees with small to medium sized hollows one of which shows evidence of use by black cockatoos;
- 6.51 hectares of foraging habitat and 58 potential nesting trees along the Pinjarra-Williams Road reserve, including two trees with small to medium sized hollows one of which shows evidence of use by black cockatoos; and
- 5.25 hectares of foraging habitat and 56 potential nesting trees along the Williams-Kondinin (Narrogin) Road reserve.

The rainbow bee-eater occurs in numerous habitats including open forests and woodlands, shrublands, in cleared or semi-cleared habitats such as areas of human habitation and farmland. It prefers open, cleared or lightly-timbered areas that are often, but not always in close proximity to permanent water (DotEE, 2016). Noting the mapped vegetation types and the condition of the vegetation within the application area, and the proximity of the application area to watercourses, the application area may include suitable habitat for this species. However noting the highly mobile nature of this species, the proposed clearing is not likely to significantly impact on the conservation status of this species.

The local area has been extensively cleared (refer to Principle (e)). Aerial imagery indicates that the application area functions as an ecological linkage between areas of remnant vegetation in the local area, and is likely to facilitate landscape connectivity and contribute to fauna dispersal between larger isolated bushland fragments in an extensively cleared landscape. The application area may be critical for the survival of fauna species within the local area and broader region. However noting that the proposed clearing does not include the entire width of roadside vegetation, the risk of habitat fragmentation as a result of the proposed clearing is minimised.

The applicant does not propose to clear all of the native vegetation within the road reserves, however as the local area is extensively cleared and noting the species present and vegetation condition detailed under principle (a), it is considered that the native vegetation within the application area is likely to comprise significant habitat for indigenous fauna.

Noting that the application area is located in an extensively cleared landscape, contains foraging and breeding habitat for black cockatoos and other fauna, and provides connectivity between remnants in the local area, the application area comprises, and is necessary for the maintenance of, significant habitat for indigenous fauna. The proposed clearing is at variance to this Principle.

#### Methodology

#### References:

- Commonwealth of Australia (2001)
- Commonwealth of Australia (2012)
- DEC (2012)
- DEWHA (2009)
- DotEE (2016)
- GHD (2016a)
- Keighery (1994)
- Parks and Wildlife (2013)
- Parks and Wildlife (2007-)

#### GIS Databases

- SAC Bio datasets (September 2016)

### **(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, two rare flora have been recorded within the local area (10 kilometre radius).

One individual of a rare flora species listed as threatened under the WC Act and as vulnerable under the EPBC Act occurs within the existing maintenance zone adjacent to the application area within the Williams-Kondinin (Narrogin) Road reserve, associated with wandoo open forest (GHD, 2016a). Approximately 0.11 hectares of suitable habitat for this species was identified within the portion of the application area within the Williams-Kondinin (Narrogin) Road reserve (GHD, 2016b).

Parks and Wildlife advised that this rare flora species is known from 26 populations over three geographically disjunct locations with an estimated total of 10,996 mature plants (Parks and Wildlife, 2016a). Within the local area near Narrogin, three known populations of this rare flora species have been recorded (Parks and Wildlife, 2016a).

The population adjacent to the application area previously extended into the adjacent Crown reserve (golf course), however this population has declined and no plants were found within the reserve in 2011 (Parks and Wildlife, 2016a). Parks and Wildlife advised that the impact of the proposed clearing on this population (one plant) represents 0.009 per cent of the total number of mature plants of this species (Parks and Wildlife, 2016a). The other two populations in the local area consist of two mature individuals, however no plants were found in one of these populations in 2011 (Parks and Wildlife, 2016a).

A portion of the application area may be necessary for the continued existence of rare flora. However noting the extent of the application area that comprises suitable and/or supporting habitat for this rare flora species, and proportion of the total number of mature plants that the population adjacent to the application area represents, impacts to this rare flora species and its conservation status are not likely to be significant. The proposed clearing is not likely to be at variance to this Principle.

**Methodology**   References:  
-GHD (2016a)  
-GHD (2016b)  
-Parks and Wildlife (2016a)

GIS Databases  
-SAC Bio Datasets (September 2016)

**(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**

The application area is located within the mapped extent of the 'Eucalypt Woodlands of Western Australian Wheatbelt' (WA Wheatbelt Woodlands) TEC, which was listed as critically endangered under the EPBC Act on 4 December 2015. According to the GHD surveys, approximately 0.32 hectares of the application area contains vegetation consistent with this TEC (GHD, 2016a; GHD, 2016b).

**Toodyay-Goomalling Road reserve**

- The GHD survey mapped 0.06 hectares within the application area, being 0.7 per cent of an overall mapped 8.49 hectare occurrence (GHD, 2016a; GHD, 2016b).

**Pinjarra-Williams Road reserve**

- The GHD survey mapped 0.16 hectares within the application area, being 1.8 per cent of an overall mapped 8.85 hectare occurrence (GHD, 2016a; GHD, 2016b).

**Williams-Kondinin (Narrogin) Road reserve**

- The GHD survey mapped 0.10 hectares within the application area, being 4.7 per cent of an overall mapped 2.14 hectare occurrence (GHD, 2016a; GHD, 2016b).

The Approved Conservation Advice for this TEC states that these woodlands are dominated by a complex mosaic of eucalypt species with a tree or mallet form over an understorey that is highly variable in structure and composition (TSSC, 2015). Parks and Wildlife advised that the Approved Conservation Advice states that areas considered critical to the survival of the TEC includes areas that meet the key diagnostic characteristics and condition thresholds for the ecological community, plus the buffer zones, particularly where this comprises surrounding native vegetation (Parks and Wildlife, 2016b). Parks and Wildlife advised that the application area meets the criteria for the TEC and is likely to be an area 'critical to survival of the ecological community' as outlined in the Approved Conservation Advice, and that the impacts to the occurrences may be significant (Parks and Wildlife, 2016b).

A portion of the application area comprises a part of, and is necessary for the maintenance of, a TEC. The proposed clearing is at variance to this Principle.

**Methodology**   References:  
-GHD (2016a)  
-GHD (2016b)  
-Parks and Wildlife (2016b)  
-TSSC (2015)

GIS databases  
-Sac Bio datasets (September 2016)

**(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 is 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 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The application area is located within the Avon Wheatbelt and Jarrah Forest Interim Biogeographic Regionalisation of Australia (IBRA) bioregions, which retain 18.5 per cent and 53.7 per cent of their pre-European vegetation extents respectively (Government of Western Australia, 2015). The local area (10 kilometre radius) retains 10-15 per cent vegetation cover; the vegetation extent within the application area represents approximately 0.5 per cent of the remaining vegetation within the local area.

As indicated in the table below, all of the Beard vegetation associations with the exception of Beard vegetation association 947, and two of the local government authorities retain less than the 30 per cent recommended threshold. The proposed clearing will reduce these current extents further, particularly noting the proportion of

'Good' or better condition vegetation within the application area. Noting the hectares of each Beard vegetation association remaining and the extents of these contained within Parks and Wildlife managed lands, the proposed clearing is not likely to significantly reduce the current extents of the Beard vegetation associations.

Noting the current vegetation extents within the local area, of the Beard vegetation associations, and of the Shire of Goomalling, the application area is located within an extensively cleared area. Noting that the application area contains significant habitat for conservation significant fauna species, habitat for rare flora, a threatened ecological community, and provides ecological linkage between areas of remnant vegetation in an extensively cleared landscape, the application area is significant as a remnant of native vegetation. The proposed clearing is at variance to this Principle.

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Department of Parks and Wildlife Managed Lands		
				Extent (ha)	Pre-European (%)	Current (%)
<b>IBRA bioregion<sup>1</sup></b>						
Avon Wheatbelt	9,517,110	1,763,063	18.5	171,729	2.3	9.7
Jarrah Forest	4,506,075	2,422,782	53.7	1,671,967	39.4	69
<b>Local government authority<sup>1</sup></b>						
Shire of Goomalling	183,542	29,673	16.1	410.4	0.2	1.3
Shire of Toodyay	169,175	85,347	50.4	39,368	23.4	46.1
Shire of Narrogin	161,816	31,645	19.5	8,493	7.2	26.8
Shire of Williams	230,472	80,074	34.7	43,284	19.5	54
<b>Beard vegetation association in bioregion<sup>1</sup></b>						
<b>Avon Wheatbelt bioregion:</b>						
7	144,189	15,427	10.7	156.2	0.1	1
352	630,582	109,441	17.3	10,151	1.6	9.3
946	43,308	8,426	19.4	725.4	1.7	8.6
947	34,017	11,769	34.6	4,773	16.1	40.5
1023	1,522,676	165,814	10.8	16,844	1.2	10.1
1049	833,385	56,842	6.8	3,273	0.4	5.7
<b>Jarrah Forest bioregion:</b>						
4	1,022,712	286,845	28.1	65,923	6.6	22.9
7	30,999	6,148	19.8	930.3	3.2	15.1
<b>Local area<sup>1</sup></b>						
10 kilometre radius	31,416	3,141 to 4,712	10 to 15			

**Methodology** References:  
 -Commonwealth of Australia (2001)  
 -<sup>1</sup>Government of Western Australia (2015)

GIS Databases:  
 -Remnant vegetation  
 -Pre-European 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.**

**Comments** **Proposed clearing is at variance to this Principle**  
 According to available databases, the application area is traversed by a number of minor watercourses and four major rivers. No wetlands occur within the application area. According to the GHD survey, approximately 2.26 hectares of the application area contains riparian vegetation (GHD, 2016a).

**Toodyay-Goomalling Road reserve**

- Two major rivers (Avon River and Mortlock River).
- Five minor watercourses (Woormening Gully, Wongamine Brook, Chitibin Brook, Boyagerring Brook and Bebakine Creek).
- The GHD survey mapped 0.54 hectares of *Eucalyptus rudis* woodland and 0.36 hectares of *Casuarina obesa* forest within saline river flats (GHD, 2016a).

**Pinjarra-Williams Road reserve**

- One major river (Williams River).
- Numerous minor non-perennial watercourses.
- The GHD survey mapped 1.29 hectares of *Eucalyptus rudis* open forest and 0.03 hectares of *Juncus acutus* subsp. *acutus* sedgeland (GHD, 2016a).

**Williams-Kondinin (Narrogin) Road reserve**

- One major river and its floodplain.
- 25 minor non-perennial watercourses.
- The GHD survey mapped 0.073 hectares of *Eucalyptus rudis* woodland (GHD, 2016a).

Noting the presence of watercourses within the application area, the application area includes native vegetation growing in association with watercourses. The proposed clearing is at variance to this Principle. However noting the extent and condition of riparian vegetation within each of the road reserves (as discussed under Principle (a)), the proposed clearing is not likely to significantly impact the environmental values of the associated watercourses.

**Methodology**    References:  
 -GHD (2016a)

                  GIS Databases  
 -Hydrography, linear

**(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 is mapped as the following soil and landform types (as per Northcote et al., 1960-68) and land degradation categories (as per Schoknecht et al., 2004):

Soil and landform type	Land degradation category
<b>Toodyay-Goomalling Road reserve</b>	
Qb29: Hard neutral red soils on rolling to hilly terrain Ub98: Hard neutral yellow mottled soils on hilly terrain with outcrops Va63: Hard alkaline yellow mottled soils on valley plains and terraces Uf1: Hard soils on broad undulating ridges and spurs, also sandy, neutral, and acidic yellow mottled soils on undulating terrain with ridges Oc30: Hard alkaline red soils on river terraces Ms7: Sandy or less commonly loamy yellow earths on very gently undulating plains	<ul style="list-style-type: none"> <li>• 30-50 per cent of map unit has a moderate to high salinity risk or is presently saline;</li> <li>• 50-70 per cent of map unit has a high to extreme wind erosion risk;</li> <li>• 50-70 per cent of map unit within watercourses have a high to extreme water erosion risk.</li> </ul>
<b>Pinjarra-Williams Road reserve</b>	
Ub90: Hard neutral and acidic yellow mottled soils Ub96: Alkaline yellow mottled soils on rolling to hilly country with tors	<ul style="list-style-type: none"> <li>• 30-50 per cent of map unit has a moderate to high salinity risk or is presently saline;</li> <li>• 3 per cent of map unit has a high to extreme wind erosion risk;</li> <li>• 3-10 per cent of map unit have a high to extreme water erosion risk.</li> </ul>
<b>Williams-Kondinin (Narrogin) Road reserve</b>	
Ub90: Hard neutral and acidic yellow mottled soils on rolling to hilly country with tors Qb30: Hard neutral red soils and acidic red soils on rolling to hilly terrain	<ul style="list-style-type: none"> <li>• 30-50 per cent of map unit has a moderate to high salinity risk or is presently saline;</li> <li>• 3 per cent of map unit has a high to extreme wind erosion risk;</li> <li>• 3-10 per cent of map unit have a high to extreme water erosion risk.</li> </ul>

Noting the extent of the proposed clearing and the long linear shape of the application area, the proposed clearing is not likely to cause appreciable land degradation in the forms of salinity, wind or water erosion. The proposed clearing is not likely to be at variance to this Principle.

**Methodology**    GIS Databases  
 -Soils, statewide  
 -Groundwater salinity

**(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 may be at variance to this Principle**  
 According to available databases, a number of conservation areas occur within the local area (10 kilometre radius). The closest of these to the application area are outlined below.

**Toodyay-Goomalling Road reserve**

- Wongamine Nature Reserve is located approximately 1.4 kilometres north.
- Three *Land for Wildlife* sites are located within 200-900 metres.

**Pinjarra-Williams Road reserve**

- Williams Nature Reserve is located approximately 1.2 kilometres north.
- Lavender Nature Reserve is located approximately 1.7 kilometres south.
- A *Land for Wildlife* site is located adjacent.

#### **Williams-Kondinin (Narrogin) Road reserve**

- A *Conservation and Land Management Act 1984* section 5(1)(g) reserve is located adjacent.
- Two un-named nature reserves are located approximately 2.1 kilometres north.
- A *Land for Wildlife* site is located within 200 metres.

Aerial imagery indicates that the application area functions as an ecological linkage between areas of remnant vegetation in the local area, including these conservation areas, and is likely to facilitate landscape connectivity and contribute to fauna dispersal between larger isolated bushland fragments in an extensively cleared landscape. The proposed clearing may also lead to the spread of weeds within adjacent conservation areas.

The proposed clearing may impact on the environmental values of adjacent and nearby conservation areas through fragmentation of linkages and spread of weeds. The proposed clearing may be at variance to this Principle.

Weed management measures will assist in addressing the risk of the introduction and spread of weeds.

**Methodology** GIS Databases:

- Imagery
- Parks and Wildlife tenure

#### **(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 not likely to be at variance to this Principle**

The three road reserves within the application area are traversed by a number of minor watercourses and four major rivers (as discussed under Principle (f)). The proposed clearing of a total of 2.26 hectares of riparian vegetation growing in association with these watercourses may cause short term erosion and sedimentation of surface water.

Approximately 30-50 per cent of the map unit within all three road reserves has a moderate to high salinity risk or is presently saline (as discussed under Principle (g)). The groundwater salinity within the application area is mapped as 7,000-14,000 milligrams per litre (saline) to 14,000-35,000 milligrams per litre (highly saline). The proposed clearing of 18.16 hectares over three separate long and linear areas is unlikely to cause a further rise in the salinity of underground water.

Noting the extent of riparian vegetation within the application area, the extent of the proposed clearing and the long linear shape of the application area, the proposed clearing is not likely to cause long-term or significant deterioration in the quality of surface water. The proposed clearing is not likely to be at variance to this Principle.

**Methodology** GIS Databases

- Hydrography, linear
- Groundwater salinity

#### **(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 average rainfall of the local area (10 kilometre radius) ranges from 400 to 700 millimetres per annum. The topography of the application area ranges from 200 to 350 metres above sea level. The low-lying portions of the application area include a number of minor watercourses and four major rivers and a floodplain (as discussed under Principle (f)). The application area is mapped as nine soil types, of which none have a high risk of flooding (as discussed under Principle (g)).

Noting the extent of the proposed clearing and the long linear shape of the application area, the proposed clearing is not likely to cause or exacerbate the incidence or intensity of flooding. The proposed clearing is not likely to be at variance to this Principle.

**Methodology** GIS Databases

- Hydrography, linear
- Rainfall – Annual Mean
- Swan Contours (50m)
- Wheatbelt Contours (50m)

#### **Planning instruments and other relevant matters.**

**Comments** The proposed clearing of 18.16 hectares of native vegetation is for the purpose of widening the maintenance zone to improve road safety along three roads in the Wheatbelt region.

The application was advertised in *The West Australian* newspaper on 5 September 2016 with a 21 day submission period. No public submissions were received in relation to this application.

Direct interest correspondence was sent to the Shire of Toodyay, Shire of Goomalling, Shire of Williams, Shire of Narrogin, and the Toodyay Land Conservation District Committee.

The Shire of Toodyay advised that four kilometres of proposed clearing along the Toodyay-Goomalling Road reserve has been mapped by the Roadside Conservation Committee as having high roadside conservation value and could potentially be considered as conservation corridor (Shire of Toodyay, 2016). The Shire of Toodyay sought for the application to be assessed on the basis of conservation value, that measures are implemented to avoid or minimise clearing in such potential corridors, and that road safety measures like crash barriers and railings should be investigated to decrease the extent of clearing in these areas (Shire of Toodyay, 2016). The Shire of Toodyay also advised that the cumulative effect that the clearing may have on secondary salinity and wind erosion should be taken into account and that an appropriate dieback management procedure is put in place to manage dieback within the application area (Shire of Toodyay, 2016).

The Shire of Goomalling advised that no planning approvals are required, the application is consistent with Council's Town Planning Scheme No. 3, and no objection is raised by Council (Shire of Goomalling, 2016).

Six Aboriginal sites of significance are mapped within the application area. It is the applicant's responsibility to ensure compliance with the *Aboriginal Heritage Act 1972*.

The application area is located within the surface water areas of the Avon River Catchment and the Murray River System proclaimed under the *Rights in Water and Irrigation Act 1914*. The applicant advised that permits have been obtained from the Department of Water authorising interference with the bed and banks of the numerous watercourses that traverse the application area.

The application was referred to the Commonwealth Department of the Environment and Energy (DotEE) and was determined to be a controlled action on 29 June 2016 (EPBC number 2016/7698).

The applicant advised that a permit has been obtained from Parks and Wildlife to take rare flora for the purpose of routine road maintenance operations within the existing road maintenance zone. Parks and Wildlife advised that the taking of rare flora for this application would not be covered under the existing permit as it does not apply to new clearing, and recommended that an 'inadvertent' permit to take rare flora should be applied for in the case of accidental damage (Parks and Wildlife, 2016a).

The applicant advised that the following impact avoidance measures have been applied (GHD, 2016c):

- clearing has been limited to four metres from edge of seal of the road, and the clearing of significant trees will be considered on an individual or small group basis;
- clearing boundaries will be strictly adhered to; and
- prior to clearing, surveys of trees identified as having hollows suitable for black cockatoos and red-tailed phascogale will be undertaken.

After taking into account the applicant's avoidance and mitigation measures, the significant residual environmental impacts to native vegetation in 'Good' or better condition identified through this assessment are:

- 16.509 hectares of black cockatoo foraging and potential nesting habitat;
- 16.509 hectares of red-tailed phascogale habitat;
- 0.32 hectares of a critically endangered TEC; and
- 16.509 hectares of significant remnant vegetation in an extensively cleared landscape.

To counterbalance the significant residual environmental impacts, the applicant proposed an offsets package that consists of a financial contribution of \$94,735 towards the purchase of 70 hectares of remnant vegetation in 'Very Good' condition to offset the significant residual impacts (GHD, 2016c). The monetary amount is based on the 2014 vegetated land values for a 50 hectare parcel of land within the Shire of Toodyay, Shire of Goomalling and Shire of Williams (GHD, 2016c).

Assessment of the suitability of the proposed offset, undertaken using DotEE's Offset Assessment Guide, indicated that the proposed offset is insufficient to counterbalance the significant residual environmental impacts of the proposed clearing. In addition, the proposed offset did not address impacts to the TEC. The Department of Water and Environmental Regulation's (DWER) calculation considered the average condition of the native vegetation within the application area as stated in the GHD surveys (GHD, 2016a; GHD, 2016b), and found that the minimum spatial offset to be achieved through land acquisition is approximately 131 hectares. The conversion of the spatial area into a monetary contribution was calculated to be \$358,698, based on the 2015 vegetated land values for a 50 hectare parcel of land within the Shire of Toodyay, Shire of Goomalling, Shire of Narrogin and Shire of Williams. Refer to Appendix 2 for details.

#### Methodology

##### References:

- GHD (2016a)
- GHD (2016c)
- Parks and Wildlife (2016a)
- Shire of Goomalling (2016)
- Shire of Toodyay (2016)

##### GIS Databases:

- Aboriginal Sites of Significance

#### 4. References

- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Commonwealth of Australia (2012) EPBC Act referral guidelines for three threatened black cockatoo species. Department of Sustainability, Environment, Water, Populations and Communities, Canberra.
- Department of Environment and Conservation (DEC) (2012) Fauna profiles: Red-tailed Phascogale (*Phascogale calura*). Last updated 8 February 2012. Department of Environment and Conservation, Western Australia. Available from: [https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/red-tailed-phascogale\\_2012.pdf](https://www.dpaw.wa.gov.au/images/documents/conservation-management/pests-diseases/red-tailed-phascogale_2012.pdf)
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- GHD (2016a) Three Areas Maintenance Zone Establishment – Flora and Fauna Assessment. March 2016. Main Roads Western Australia. (DWER ref A1153128)
- GHD (2016b) Maintenance Zone Establishment – Toodyay Goomalling Road (M060), Williams Narrogin Highway (H053) and Pinjarra Williams Road (M053) – Impact Assessment of Clearing. August 2016. Main Roads Western Australia. (DWER ref A1147236)
- GHD (2016c) Maintenance Zone Establishment – Toodyay Goomalling Road (M060), Williams Narrogin Highway (H053) and Pinjarra Williams Road (M053) – Offset Proposal. August 2016. Main Roads Western Australia. (DWER ref A1378224)
- Government of Western Australia (2015). 2015 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2015. WA Department of Parks and Wildlife, Perth.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Northcote, K.H. with Beckmann, G.G., Bettenay, E., Churchward, H.M., van Dijk, D.C., Dimmock, G.M., Hubble, G.D., Isbell, R.F., McArthur, W.M., Murtha, G.G., Nicolls, K.D., Paton, T.R., Thompson, C.H., Webb, A.A. and Wright, M.J. (1960-68): 'Atlas of Australian Soils, Sheets 1 to 10, with explanatory data'. CSIRO and Melbourne University Press: Melbourne.
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- Shire of Goomalling (2016) Direct interest response for clearing permit application CPS 7227/1. (DWER ref A1161008)
- Threatened Species Scientific Committee (TSSC) (2015). Approved Conservation Advice (including listing advice) for the Eucalypt Woodlands of the Western Australian Wheatbelt. Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/biodiversity/threatened/communities/pubs/128-conservation-advice.pdf>.



### Appendix 1: Vegetation types and conditions surveyed

GHD undertook mapping of the vegetation types and conditions within the application area and surrounding road reserves (GHD, 2016a). Condition was rated according Keighery (1994) (GHD, 2016a). The breakdown of vegetation types and conditions within each road reserve surveyed are provided in the tables below.

Vegetation type	Vegetation condition	Extent within Toodyay-Goomalling Road reserve (ha)	Extent within Pinjarra-Williams Road reserve (ha)	Extent within Williams-Kondinin (Narrogin) Road reserve (ha)
<i>Acacia acuminata</i> / <i>Allocasuarina huegeliana</i> tall shrubland	Excellent to Very Good	0.106		
	Very Good	0.085		
<i>Acacia acuminata</i> over introduced grasses	Very Good to Good	0.037		
	Degraded	0.122		
<i>Acacia acuminata</i> tall open shrubland	Good		0.062	
	Good to Degraded		0.025	
	Degraded		1.519	
	Degraded to Completely Degraded		0.011	
	Completely Degraded		0.039	
	Very Good			0.012
<i>Acacia acuminata</i> tall shrubland	Good			0.075
	Good to Degraded			0.111
	Degraded			0.013
	Degraded to Completely Degraded			0.099
	Completely Degraded			0.056
	Very Good		0.184	
<i>Allocasuarina huegeliana</i> closed forest	Good		0.159	
	Good to Degraded		0.151	
	Degraded		0.769	
	Very Good			0.005
<i>Allocasuarina huegeliana</i> open forest	Very Good to Good			0.003
	Good			0.067
	Degraded to Completely Degraded			0.006
	Very Good	0.008		
	Very Good to Good	0.044		
	Good	0.169		
<i>Casuarina obesa</i> forest over scattered shrubs and grasses	Degraded	0.018		
	Degraded to Completely Degraded	0.061		
	Completely Degraded	0.056		
	Excellent to Very Good			0.015
<i>Conyobia calophylla</i> and <i>Eucalyptus wandoo</i> woodland	Completely Degraded			0.013

Vegetation type	Vegetation condition	Extent within Toodyay-Goomalling Road reserve (ha)	Extent within Pinjarra-Williams Road reserve (ha)	Extent within Williams-Kondinin (Narrogin) Road reserve (ha)
<i>Corymbia calophylla</i> open forest	Excellent to Very Good			0.026
	Very Good			0.051
	Very Good to Good			0.267
	Good			0.648
	Good to Degraded			0.445
	Degraded		0.544	0.192
<i>Cryptandra arbutiflora</i> var. <i>arbutiflora</i> low shrubland	Very Good to Good			0.001
<i>Eucalyptus loxophleba</i> and <i>Eucalyptus wandoo</i> regrowth	Completely Degraded			0.001
<i>Eucalyptus loxophleba</i> open forest	Degraded		0.060	
	Very Good	0.078		
	Very Good to Good	0.134		
	Good	0.042		
	Good to Degraded	0.236		
	Degraded	1.652		
	Degraded to Completely Degraded	2.514		
	Completely Degraded	0.211		
	Degraded		1.267	
	Degraded to Completely Degraded		0.026	
<i>Eucalyptus rudis</i> open forest	Very Good			0.003
	Good			0.045
	Degraded			0.007
	Completely Degraded			0.005
<i>Eucalyptus rudis</i> woodland	Degraded	0.110		
	Degraded to Completely Degraded	0.424		
	Completely Degraded	0.011		
	Very Good	0.002		
	Degraded	0.007		
<i>Eucalyptus salmonophloia</i> over introduced grasses	Completely Degraded	0.055		
	Excellent to Very Good			0.022
	Very Good			0.000009
	Very Good to Good			0.020
<i>Eucalyptus wandoo</i> open forest	Good		0.036	0.015
	Good to Degraded		0.138	0.016
	Degraded		1.176	0.024
	Degraded to Completely Degraded		0.085	
	Completely Degraded		0.005	0.018

Vegetation type	Vegetation condition	Extent within Toodyay-Goomalling Road reserve (ha)	Extent within Pinjarra-Williams Road reserve (ha)	Extent within Williams-Kondinin (Narrogin) Road reserve (ha)
<i>Eucalyptus wandoo</i> open woodland over <i>Acacia acuminata</i> tall shrubland	Very Good			0.145
	Completely Degraded			0.293
<i>Eucalyptus wandoo</i> over <i>Acacia</i> and grasses	Degraded	0.030		
	Degraded to Completely Degraded	0.089		
	Completely Degraded	0.028		
	Excellent to Very Good	0.044		
<i>Eucalyptus wandoo</i> woodland over <i>Banksia sessilis</i> / <i>Adenanthos cygnorum</i> or mixed shrubs	Very Good to Good	0.002		
	Good	0.001		
	Degraded	0.00005		
<i>Eucalyptus wandoo</i> woodland over open low shrub and scattered grasses	Degraded to Completely Degraded	0.005		
	Degraded		0.030	
<i>Juncus</i> sp. sedgeland	Cleared	0.002	19.121	19.598
	HD	31.031		
Infrastructure Area	Infrastructure Area	27.362	23.477	21.982
	Good			0.023
Planted Trees	Degraded		1.037	0.002
	Degraded to Completely Degraded		0.025	
	Completely Degraded		0.112	0.256
	Degraded		0.215	
Scattered Natives	Completely Degraded		0.016	
	Very Good			0.320
Revegetated areas	Very Good to Good			0.003
	Good			0.155
	Good to Degraded			0.566
	Degraded			0.397
	Degraded to Completely Degraded			0.007
	Completely Degraded			1.061
<b>Total area surveyed</b>		<b>64.793</b>	<b>50.299</b>	<b>47.111</b>

## Appendix 2: Assessment of suitability of proposed offset

After taking into account the applicant's avoidance and mitigation measures, the significant residual environmental impacts to native vegetation in 'Good' or better condition identified through this assessment are:

- 16.509 hectares of black cockatoo foraging and potential nesting habitat;
- 16.509 hectares of red-tailed phascogale habitat;
- 0.32 hectares of a critically endangered TEC; and
- 16.509 hectares of significant remnant vegetation in an extensively cleared landscape.

To counterbalance the significant residual environmental impacts, the applicant proposed an offsets package that consists of a financial contribution of \$94,735 towards the purchase of 70 hectares of remnant vegetation in 'Very Good' condition to offset the significant residual impacts (GHD, 2016c).

Assessment of the suitability of the applicant's proposed offset was undertaken using the DotEE's Offset Assessment Guide. This calculation indicated that the minimum spatial offset to be achieved through land acquisition is approximately 131 hectares. The conversion of the minimum spatial offset into a monetary contribution was calculated to be \$358,698, based on the 2015 vegetated land values for a 50 hectare parcel of land within the Shire of Toodyay, Shire of Goomalling, Shire of Narrogin and Shire of Williams.

Table 1: Calculation of financial offset contribution

	Local government authority	Minimum spatial offset required (ha)	Cost per hectare (\$)	Total (\$)
<b>Toodyay-Goomalling Road reserve</b> (6.4 hectares, of which 5.841 hectares is in 'Good' or better condition)	Shire of Toodyay (31.7 per cent of this portion of the application area)	14.69	5,160	75,800.40
	Shire of Goomalling (68.3 per cent of this portion of the application area)	31.66	2,140	67,752.40
	<b>Subtotal</b>	<b>46.35</b>		<b>\$143,552.80</b>
<b>Pinjarra-Williams Road reserve</b> (6.51 hectares, of which 6.333 hectares is in 'Good' or better condition)	Shire of Williams (100 per cent of this portion of the application area)	50.25	2,520	126,630.00
	<b>Subtotal</b>	<b>50.25</b>		<b>\$126,630.00</b>
<b>Williams-Kondinin (Narrogin) Road reserve</b> (5.25 hectares, of which 4.33 hectares is in 'Good' or better condition)	Shire of Williams (33.6 per cent of this portion of the application area)	11.56	2,520	29,131.20
	Shire of Narrogin (66.4 per cent of this portion of the application area)	22.84	2,600	59,384.00
	<b>Subtotal</b>	<b>34.4</b>		<b>\$88,515.20</b>
	<b>TOTAL</b>	<b>131</b>		<b>\$358,698.00</b>