



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 5913/1
Permit Holder:	Shire of West Arthur
Duration of Permit:	3 May 2014 - 3 May 2019

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 road construction, road widening, drainage and improving sight lines.

2. Land on which clearing is to be done

Howie Road reserve, Arthur River (PINs: 11235731, 11235748 and 11235727)

Anderson Road reserve, Bokal (PIN: 11249811)

Bowelling-Duranillin Road reserve, Bowelling (PINs: 11518531, 11518532, 11518533 and 11301204)

Horley Road reserve, Darkan (PIN: 11249835)

Capercup Road reserve, Duranillin (PIN: 1389274)

3. Area of Clearing

The Permit Holder must not clear more than 0.5 hectares of native vegetation within the combined areas hatched yellow on attached Plan 5913/1a, Plan 5913/1b, Plan 5913/1c, Plan 5913/1d, Plan 5913/1e and Plan 5913/1f.

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 *Local Government Act 1995* or any other written law.

PART II – MANAGEMENT CONDITIONS

6. 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:

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

7. Dieback and weed control

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

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

The Permit Holder shall establish and maintain native vegetation within the area cross hatched red on attached Plan 5913/1g in accordance with the following conditions:

- (a) native vegetation shall be established and maintained to an average planting density of 2000 stems per hectare; and
- (b) *planting* is to commence within twelve months of clearing any area authorised under this Permit.

DEFINITIONS

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

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;

planting means the re-establishment of vegetation by creating favourable soil conditions and planting seedlings of the desired species; 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 Parks and Wildlife Regional Weed Summary, regardless of ranking; or
- (c) not indigenous to the area concerned.



M Warnock
MANAGER
NATIVE VEGETATION CONSERVATION BRANCH

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

3 April 2014

Plan 5913/1 a



LEGEND

- Road Centrelines
- Cadastre
- Clearing Instruments
- Areas Approved to Clear
- Bridgetown 50cm Orthomosaic - Landgate 2004

Darkan 50cm Orthomosaic - Landgate 2006

Scale 1:4430
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M. Warnock Date 3/4/14

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

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.

Government of Western Australia
Department of Environment Regulation
WA Crown Copyright 2002

* Project Data. This data has not been quality assured. Please contact map author for details.

Plan 5913/1 b



LEGEND

- Road Centrelines
 Cadastre
 Clearing Instruments
- Areas Approved to Clear
 Bridgetown 50cm
 Orthomosaic - Landgate
 2004

Darkan 50cm Orthomosaic -
Landgate 2006



Scale 1:770
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M. Warnock Date 3/11/14
M. Warnock

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

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.

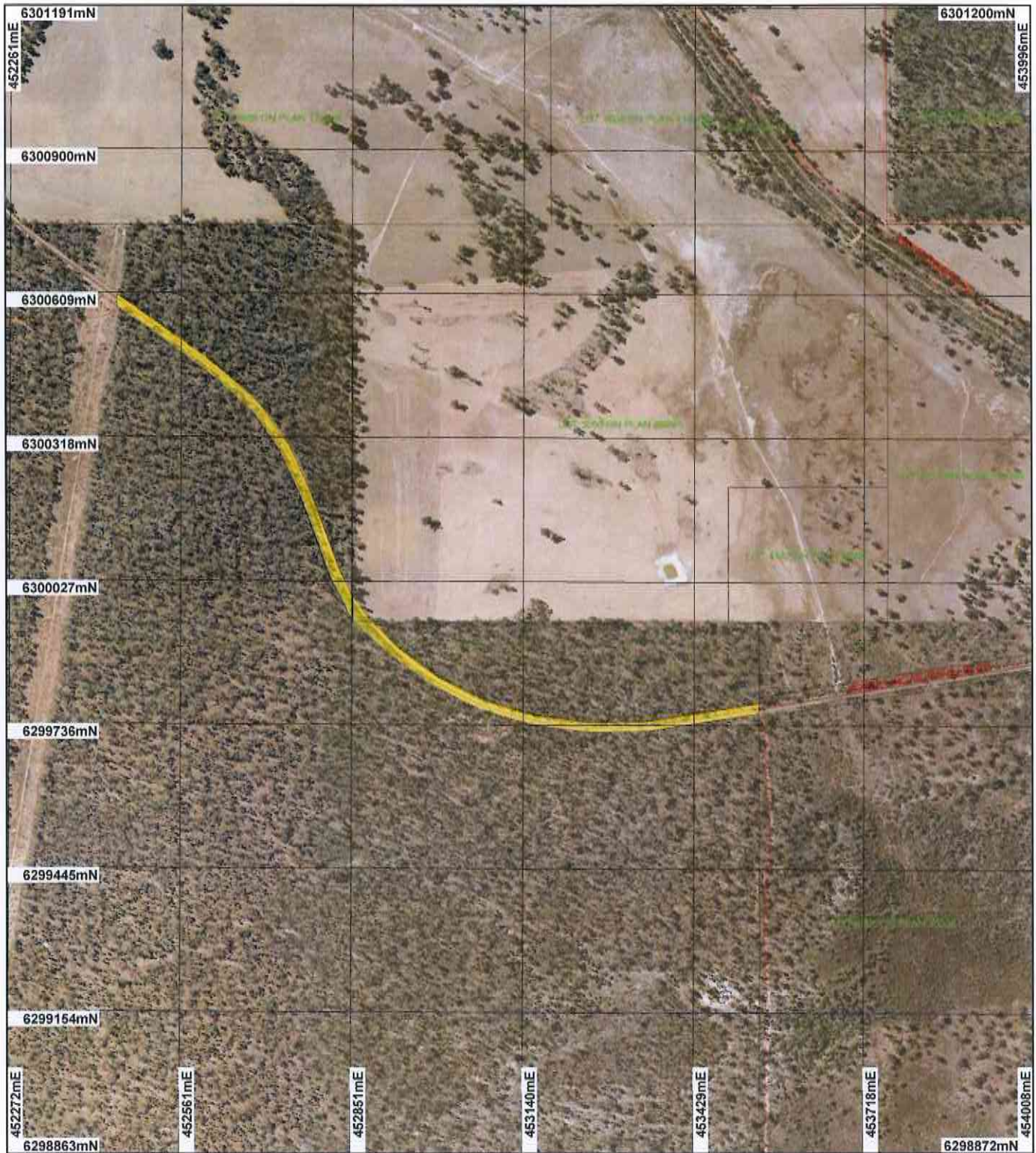


Government of Western Australia
Department of Environment Regulation

WA Crown Copyright 2002

* Project Data. This data has not been quality assured. Please contact map author for details.

Plan 5913/1 c



LEGEND

- Road Centrelines
- Clearing Instruments
- Areas Approved to Clear
- Bridgetown 50cm Orthomosaic - Landgate 2004

Darkan 50cm Orthomosaic - Landgate 2006



Scale 1:10267
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M. Wamock Date 3/4/14

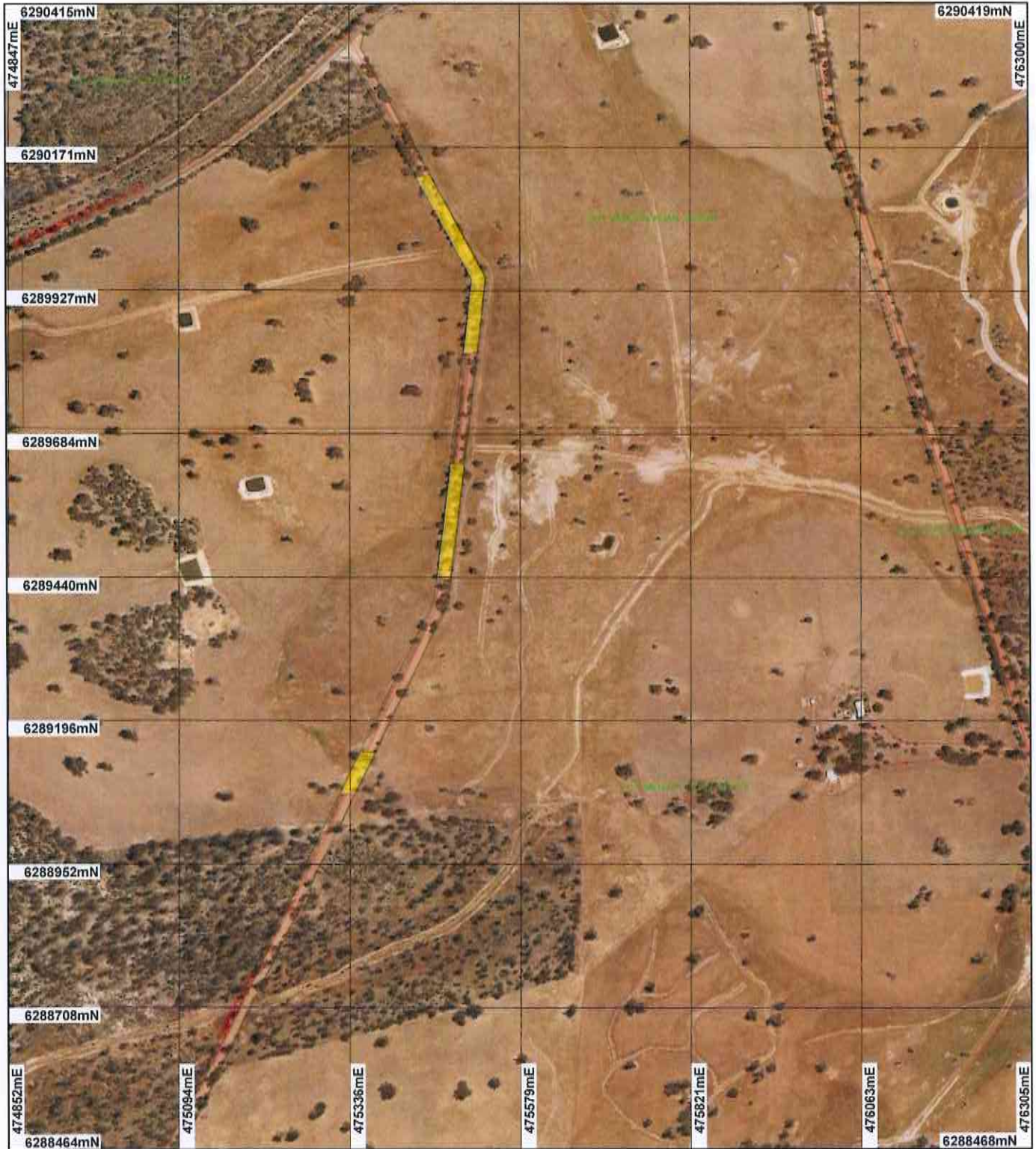
Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



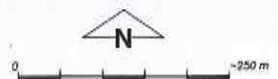
* Project Data. This data has not been quality assured. Please contact map author for details.

Plan 5913/1 d



LEGEND

-  Road Centrelines
-  Clearance
-  Clearing Instruments
-  Areas Approved to Clear
-  Dinninup 50cm Orthomosaic - Landgate 2004



Scale 1:8601
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M. Warnock Date 3/4/14
M. Warnock

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

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



Government of Western Australia
Department of Environment Regulation





WA Crown Copyright 2002

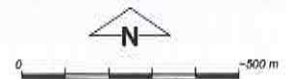
* Project Data. This data has not been quality assured. Please contact map author for details.

Plan 5913/1 e



LEGEND

-  Road Centrelines
-  Cadastre
-  Clearing Instruments
-  Areas Approved to Clear



Scale 1:16686
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map has not been projected. This may result in geometric distortion or measurement inaccuracies.

M. Warnock Date *3/4/14*

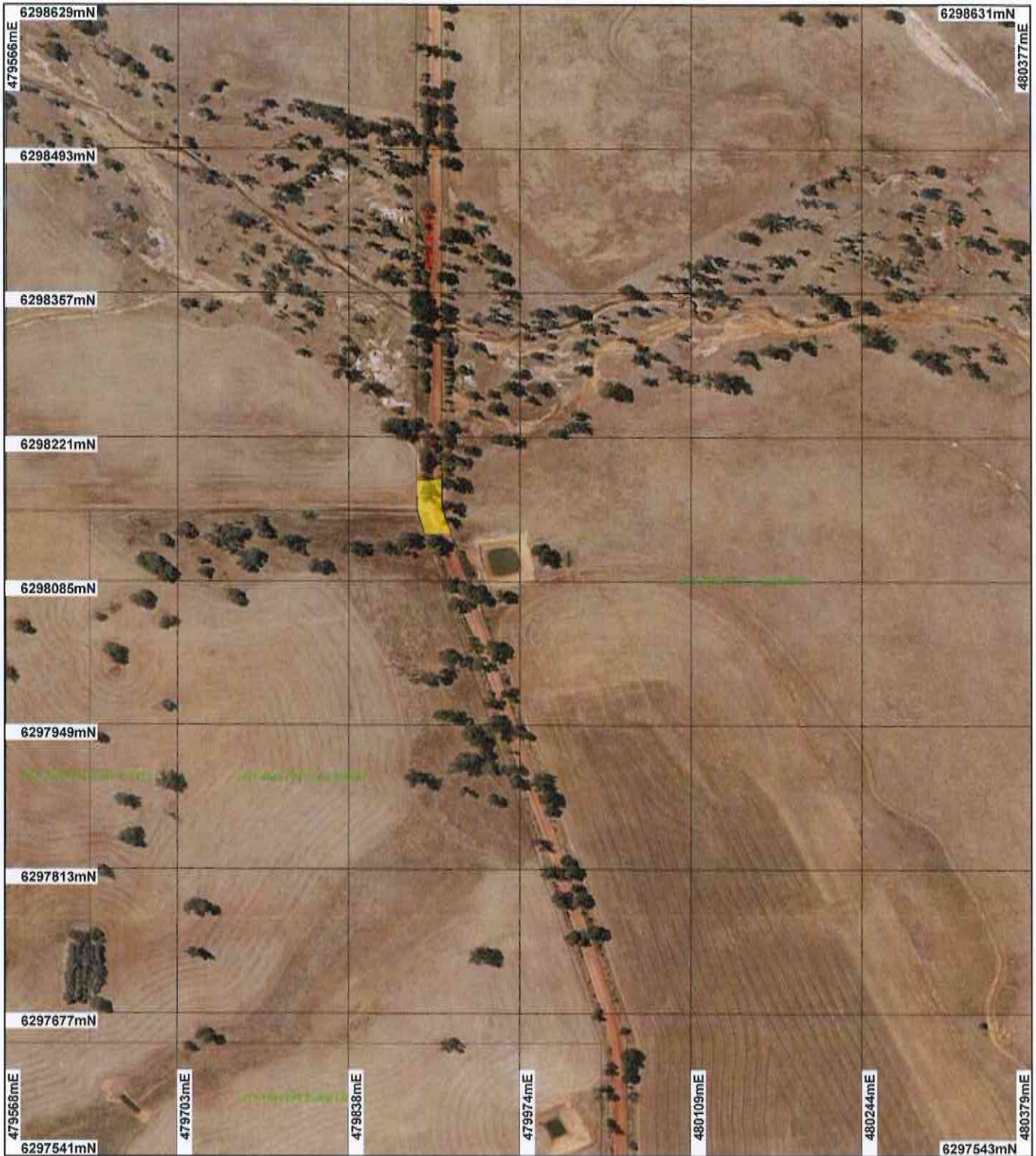
M. Warnock
Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



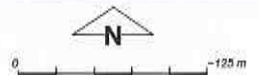
* Project Data. This data has not been quality assured. Please contact map author for details.

Plan 5913/1 f



LEGEND

- Road Controlines
- Cadastre
- Clearing Instruments
- Area Approved to Clear



Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M. Warlock Date 3/4/14

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

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



Government of Western Australia
Department of Environment Regulation




WA Crown Copyright 2002

* Project Data. This data has not been quality assured. Please contact map author for details.

Plan 5913/1 g



LEGEND

-  Road Centralines
 -  Clearing Instruments
 -  Areas Subject to Conditions
 -  SWREL-AL *
-  50cm Orthomosaic - Landgate 2004



Scale 1:10465
(Approximate when reproduced at A4)

Geocentric Datum Australia 1994

Note: the data in this map have not been projected. This may result in geometric distortion or measurement inaccuracies.

M Wamock
Date: 3/10/14

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

Information derived from this map should be confirmed with the data custodian acknowledged by the agency acronym in the legend.



Government of Western Australia
Department of Environment Regulation

WA Crown Copyright 2002

* Project Data. This data has not been quality assured. Please contact map author for details.



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 5913/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Shire of West Arthur

1.3. Property details

Property: ROAD RESERVE (BOKAL 6392)
ROAD RESERVE (BOWELLING 6225)
ROAD RESERVE (DURANILLIN 6393)
ROAD RESERVE (ARTHUR RIVER 6315)
ROAD RESERVE (DARKAN 6392)
ROAD RESERVE (BOWELLING 6225)

Local Government Area: Shire of West Arthur
Colloquial name: Anderson Road, Bowelling Duranillin Road, Capercup Road, Horley Road and Howie Road

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
0.5		Mechanical Removal	Railway construction or maintenance

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 3 April 2014

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Beard vegetation association 3 is described as medium forest; jarrah-marri (Shepherd et al, 2001).	The clearing of 0.5 hectares of native vegetation within Anderson Road, Bowelling-Duranillin Road, Capercup Road, Horley Road and Howie Road reserves is for the purpose of road maintenance and widening and improving site lines at intersections.	Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery 1994)	The vegetation clearing description has been determined using GIS Darkan 50cm Orthomosaic (2006), Dinninup 50cm Orthomosaic (2004) maps and advice from the Shire of West Arthur (2013, 2014).
Beard vegetation association 4 is described as medium woodland; marri & wandoo (Shepherd et al, 2001).		to	
Beard vegetation association 1023 is described as medium woodland; York gum, wandoo & salmon gum (Eucalyptus salmonophloia) (Shepherd et al, 2001).		Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	
Beard vegetation association 1114 is described as shrublands tree-heath; paperbark over teatree thickets (Shepherd et al, 2001).			
Mattiske vegetation complex Yalanbee (Y5): mixture of open forest of Eucalyptus marginate subsp. thalassica-Corymbia calophylla and woodland of Eucalyptus wandoo on lateritic uplands in semiarid to periarid zones (Mattiske & Havel, 1998).			

Mattiske vegetation complex
Pindalup (Pn): open forest of
Eucalyptus marginate subsp.
thalassica-Corymbia calophylla on
slopes and open woodland of
Eucalyptus wandoo with some
Eucalyptus patens on the lower
slopes in semiarid and arid zones
(Mattiske & Havel, 1998).

Mattiske vegetation complex Swamp
(S): mosaic of low open woodland of
Melaleuca preissiana-Banksia
littoralis, closed scrub of Myrtaceae
spp., closed heath of Myrtaceae spp.
and shrublands of Baumea and
Leptocarpus spp. on seasonally wet
or moist sand, peat and clay soils on
valley floors in all climatic zones
(Mattiske & Havel, 1998).

3. Assessment of application against clearing principles

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

Comments

Proposal is not likely to be at variance to this Principle

The application is to clear 0.5 hectares of native vegetation within Anderson Road, Bowelling Duranillin Road, Capercup Road, Horley Road and Howie Road reserves for the purpose of road maintenance and widening, drainage works and improving site lines.

Based on aerial imagery, information from the Shire of West Arthur (2013, 2014) and advice from the Roadside Conservation Committee (RCC, 2014), the vegetation condition (Keighery, 1994) at each site is noted as:

Anderson Road - good condition;
Bowelling Duranillin Road - very good condition;
Bowelling Duranillin Road at Gibbs Road intersection - degraded condition;
Capercup Road - good to degraded condition;
Horley Road - degraded condition;
Howie Road - good to degraded condition.

Bowelling Duranillin Road sites are mapped within Beard vegetation association 3 and 114 which have 68 per cent and 69 per cent remnant vegetation respectively remaining in the Jarrah Forest Bioregion. The remaining sites are within mapped Beard vegetation associations 4 and 1023 which respectively have 28 per cent and 21 per cent remaining for the same Bioregion. Vegetation associations 4 and 1023 are therefore considered to be below threshold levels for maintaining biodiversity (Commonwealth of Australia, 2001; Government of Western Australia, 2011).

Several priority listed flora (Priority 2, Priority 3 and Priority 4) species occur on similar vegetation and soil types as that present at the Howie Road site and the Bowelling Duranillin Road site. However, none of these species are known from the application areas.

One rare flora species is recorded within close proximity to the eastern portion of Bowelling Duranillin Road reserve. The proposed works in the vicinity of the rare flora will involve applying bitumen to the existing gravel shoulder. The proposed works at this location are not likely to impact upon the rare flora population and the Department of Parks and Wildlife has advised that a permit to take rare flora will not be necessary (Parks and Wildlife, 2014).

There are a number of threatened fauna species recorded within a 10 kilometre radius of the application areas, including Carnaby's cockatoo (*Calyptorhynchus latirostris*), Forest Red-tailed black cockatoo (*Calyptorhynchus banksia naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*), Southern Brush-tailed Phascogale (*Phascogale tapoatafa* subsp. *tapoatafa*), Red-tailed Phascogale (*Phascogale ornatus*), Chuditch (*Dasyurus geoffroii*) and the Curlew Sandpiper (*Calidris ferruginea*). The majority of the road reserves under application are narrow, linear in nature and comprise patchy distribution of vegetation with significant gaps and are therefore unlikely to provide significant habitat for indigenous fauna. The vegetation within Bowelling Duranillin Road reserve (0.338 hectares) is likely to provide more valuable habitat for fauna than the other road reserves due to its condition, however it is adjacent to an extensive area of State Forest which will provide more significant habitat for fauna than the roadside vegetation under application.

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

- Methodology** **References:**
- Commonwealth of Australia (2001)
 - Government of Western Australia (2011)
 - Keighery (1994)
 - RCC (2014)
- GIS Databases:**
- Pre-European Vegetation
 - Soils, Statewide
 - SAC Bio datasets - accessed 17/01/2014
 - Darkan 50cm Orthomosaic (2006)
 - Dinninup 50cm Orthomosaic (2004)

(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 Proposal is not likely to be at variance to this Principle

With the exception of Bowelling Duranillin Road, the road reserves under application all demonstrate a degree of vegetation decline, showing 'edge effects' associated with adjoining agricultural and road use activities resulting in some vegetation loss and weed/pasture invasion (Shire of West Arthur, 2013). Aerial imagery indicates that these road reserves are narrow and fragmented. Bowelling Duranillin is bounded by State Forest and Reserve 31088 where the 'edge effects' are only associated with the adjoining road use and are significantly less.

There are a number of threatened fauna species which have been recorded within 10 kilometre radius of the applied road reserves within the Shire of West Arthur. This includes but not limited to Carnaby's cockatoo (*Calyptorhynchus latirostris*), Forest Red-tailed black cockatoo (*Calyptorhynchus banksia naso*), Baudin's cockatoo (*Calyptorhynchus baudinii*), Bilby (*Macrotis lagotis*), Southern Brush-tailed Phascogale (*Phascogale tapoatafa* subsp. *tapoatafa*), Red-tailed Phascogale (*Phascogale ornatus*), Chuditch (*Dasyurus geoffroi*) and the Curlew Sandpiper (*Calidris ferruginea*) (DEC, 2007-).

Other conservation significant fauna recorded within the Shire of West Arthur include the Tamar Wallaby (*Macropus eugenii* subsp. *derbianus*), Western Brush Wallaby (*Macropus irma*), Quenda (*Isoodon obesulus* subsp. *fusciventer*), Shy Heathwren, Western (*Hylacola cauta* subsp. *whitlocki*), Biting midge (*Austroconops mcmillani*), Rainbow Bee-eater (*Merops ornatus*), Common Sandpiper (*Actitis hypoleucos*), Eastern Great Egret (*Ardea modesta*), Red-necked Stint (*Calidris ruficollis*), Peregrine Falcon (*Falco peregrinus*), Australian Peregrine Falcon (*Falco peregrinus* subsp. *macropus*), Wood Sandpiper (*Tringa glareola*), Bush Stone-curlew (*Burhinus grallarius*) and the Carpet python (*Morelia spilota* subsp. *imbricata*) (DEC, 2007-).

The majority of the road reserves under application are narrow, linear in nature and comprise patchy distribution of vegetation with significant gaps and are therefore unlikely to provide significant habitat for indigenous fauna. The vegetation within Bowelling Duranillin Road reserve (0.338 hectares) is likely to provide more valuable habitat for fauna than the other road reserves due to its condition, however it is adjacent to an extensive area of State Forest which will provide more significant habitat for fauna than the roadside vegetation under application.

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

- Methodology** **References:**
- DEC (2007-)
 - Shire of West Arthur (2013)
- GIS Databases:**
- DPaW Tenure
 - NatureMap - accessed 17/01/2014
 - SAC Bio datasets - accessed 17/01/2014
 - Darkan 50cm Orthomosaic (2006)
 - Dinninup 50cm Orthomosaic (2004)

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

Comments Proposal is not likely to be at variance to this Principle

Eight rare flora species have been recorded within the local area (10 kilometre radius) of the application areas, of which, one is found within the Bowelling Duranillin Road reserve. With the exception of Bowelling Duranillin Road reserve, none of the identified rare flora species have been recorded in any other of the application areas.

The identified rare flora species is described as a tuberous, perennial herb, 0.3 - 0.6 metres tall with yellow and brown flowers from September to October (Western Australian Herbarium, 2008). It is found in sandy clay soil, in winter wet swamps and is killed if burnt during the vegetative or flowering phase May to October (Brown et al, 1998).

The rare flora species is mapped within close proximity to the eastern portion of the Bowelling Duranillin Road reserve, with populations of the species recorded both north and south of the road and within the adjacent Reserve (31088) (Parks and Wildlife, 2014).

The proposed works in the vicinity of the rare flora will involve applying bitumen to the existing gravel shoulder. The proposed works at this location are not likely to impact upon the rare flora population and the Department of Parks and Wildlife has advised that a permit to take rare flora will not be necessary (Parks and Wildlife, 2014).

The proposed clearing is not likely to be at variance to this principle.

- Methodology**
- References:
- Brown et al (1998)
 - Parks and Wildlife (2014)
 - Western Australian Herbarium (2008)
- GIS Databases:
- Mattiske Vegetation Complexes
 - Pre-European Vegetation
 - Soils, Statewide - DA 11/99
 - Darkan 50cm Orthomosaic (2006)
 - Dinninup 50cm Orthomosaic (2004)
 - SAC Bio datasets - accessed 17/01/2014

(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** **Proposal is not at variance to this Principle**
- There are no known records of Threatened Ecological Communities (TECs) within the Shire of West Arthur.
- Therefore, the vegetation under application does not comprise the whole or part of, or is necessary for the maintenance of a TEC and the proposed clearing is not at variance to this principle.

- Methodology**
- GIS Databases:
- Mattiske Vegetation Complexes
 - Pre-European Vegetation
 - Soils, Statewide - DA 11/99
 - SAC Bio datasets - accessed 17/01/2014

(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** **Proposal is not likely to be at variance to this Principle**
- Aerial imagery indicates that the local area (10 kilometre radius) is approximately 25 per cent vegetated.
- The IBRA Bioregion (Jarrah Forest) and the local government agency (Shire of West Arthur) retain approximately 54 per cent and 30 per cent of their respective pre-European extents (Government of Western Australia, 2013).
- The application areas are mapped as Beard Vegetation Associations 3, 4, 1023 and 114 which respectively retain approximately 2,390,591 hectares (68 per cent), 1,022,712 hectares (28 per cent), 14,952 hectares (21 per cent) and 19,836 hectares (60 per cent) of their pre-European extent within the Jarrah Forrest Bioregion.
- Mattiske Complexes Pindalup (166,695 hectares), Yalanbee (124,376 hectares) and Swamp (53,657 hectares) have also been mapped within the application areas and approximately 79 per cent, 68 percent and 78 per cent of the pre-European extent respectively remains.
- The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with the 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).
- Although Beard Vegetation Associations 4 and 1023 have low representation, given that there is approximately 25 per cent pre-European vegetation remaining in the local area (10 kilometre radius) and the small size (0.5 hectares) of the clearing which is restricted to narrow, linear road reserves spread over several kilometres, the potential reduction in vegetation representation is likely to be minimal.
- Therefore the proposed clearing is not likely to be at variance to this principle.

	Pre-European (ha)	Current extent (ha)	Extent remaining (%) (%)	Extent in DEC Managed Lands
IBRA Bioregions*				
Jarrah Forest	4,506,660	2,457,731	54.54	68.32
LGA**				
Shire of West Arthur	283,182	87,449	30.88	33.46
Beard Vegetation Association in Bioregion*				
3	2,390,591	1,629,894	68.18	80.08
4	1,022,712	292,975	28.65	22.37
1023	14,952	3,140	21.04	41.42
1114	19,836	12,086	60.93	78.85
Mattiske Vegetation Complex***				
Pindalup (Pn)	166,695	131,175	79.04	60.55
Yalanbee (Y5)	124,376	84,654	68.06	39.70
Swamp (S)	53,657	42,342	78.91	64.49

* Government of Western Australia 2013

** Heddle et al. 1980

***Mattiske and Havel 1998

Methodology

References:

- Commonwealth of Australia (2001)
- Government of Western Australia (2013)
- Heddle et al (1980)
- Mattiske and Havel (1998)

GIS Databases:

- Pre-European Vegetation
- Mattiske Vegetation
- Darkan 50cm Orthomosaic (2006)
- Dinninup 50cm Orthomosaic (2004)

(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

Proposal is at variance to this Principle

A number of wetlands and watercourses have been recorded within a 10 kilometre radius of the various road reserves under application, the closest of which are minor non-perennial watercourses which intersect Bowelling-Duranillin Road and Howie Road reserve application areas. In addition, the southern portion of Bowelling-Duranillin Road reserve and central portion of Capercup South West Road reserve application areas are located within areas of low relief and subject to inundation.

Therefore, the proposed clearing is at variance to this principle.

Measures to avoid and minimise the clearing of riparian vegetation along the watercourses and areas subject to inundation, will assist in mitigating any long term impacts to the waterways from road widening or drainage works.

Methodology

References:

- Shire of West Arthur (2014)

GIS Databases:

- Hydrography, linear
- Hydrography, linear (hierarchy)
- Darkan 50cm Orthomosaic (2006)
- Dinninup 50cm Orthomosaic (2004)

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

Comments Proposal is not likely to be at variance to this Principle

The chief soils within the application areas are predominantly sandy soils and sandy yellow mottled soils, some of which contain ironstone gravels (Northcote et al, 1960-68). These soils are generally associated with a low risk of salinity, with the exception of the low relief sections within Bowelling Duranillin Road and Capercup Road application areas which have a high salinity risk.

Several non-perennial watercourses intersect or are in close proximity to Bowelling Duranillin Road and Howie Road application areas. In addition, portions of Bowelling Duranillin Road and Capercup Road application areas are located within areas of low relief and subject to inundation. The groundwater salinity within the identified road application areas ranges from 3000 (saline) to greater than 35000 (brine) total dissolved solids per milligram per litre.

The main land degradation risks associated with removal of vegetation on these identified soil types is wind erosion on the sandy soils and waterlogging in the low lying clay based soils (Shire of West Arthur, 2014).

The proposed clearing is for road maintenance and widening, drainage works and improving site lines which will occur over narrow, linear areas, Therefore the proposed clearing of 0.5 hectares over five road reserves is not likely to cause appreciable land degradation.

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

Methodology

References:

- Northcote et al (1960-68)
- GIS Databases:
 - Groundwater Salinity, Statewide
 - Hydrography, linear
 - Salinity Risk
 - Soils, Statewide
 - Topographic Contours, Statewide

(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 Proposal may be at variance to this Principle

There are a number of areas set aside for conservation purposes within a 10 kilometre radius of the application areas, the closest being Reserve (31088) and Muja State Forest which are located immediately adjacent to both sides of Bowelling Duranillin Road reserve.

The proposed clearing has the potential to indirectly impact the environmental values of the adjacent reserves through the spread or introduction of Phytophthora and weed species by machinery or the importation of fill required for road construction. Weed and Phytophthora management practices will assist in mitigating the spread of weeds and dieback.

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

Methodology

GIS Databases:

- Cadastre for labelling_1
- DPaW Tenure
- Darkan 50cm Orthomosaic (2006)
- Dinninup 50cm Orthomosaic (2004)

(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 Proposal may be at variance to this Principle

The Bowelling Duranillin Road application area occurs within a mapped groundwater area and irrigation district (Collie River Irrigation District) under the Rights in Water Irrigation Act 1914 and within the Country Areas Water Supply Act 1947 (CAWS Act) gazetted Wellington District Dam Catchment. This catchment has been subject to CAWS Act native vegetation clearing control since November 1976 to prevent salinisation of water resources. The area of proposed clearing within Bowelling Duranillin Road is located within Zone A of the catchment, which is a very high salinity risk area. With high salinity risk areas, the Department of Water Policy and Guidelines for the 'Granting of Licences to Clear Indigenous Vegetation' provide for the grant of a licence for government works subject to an equivalent area being reforested within the same or higher salinity risk zone (DoW, 2014).

The Department of Water (DoW) advise that given the small size (approximately 0.338 hectares) of the proposed clearing within the Bowelling Duranillin Road application sites, the amalgamation of similar offset requirements over time to create sustainable revegetation areas is acceptable and that the DoW has no objection to the proposal (DoW, 2014).

Several non-perennial watercourses intersect or are in close proximity to Bowelling Duranillin Road and Howie Road application areas. In addition, portions of Bowelling Duranillin Road and Capercup Road application areas are located within areas of low relief and subject to inundation. The groundwater salinity within the identified road application areas ranges from 3000 (saline) to greater than 35000 (brine) total dissolved solids per milligram per litre.

Although the size of the application areas is small (0.5 hectares), given the above, the clearing of native vegetation may exacerbate salinity in surface water expression areas and therefore may be at variance to this principle.

The purpose of clearing is for upgrading road surfaces which will include the installation of appropriate drainage structures. As such the impacts of clearing on water logging may be mitigated at a local scale.

To mitigate the impacts of clearing 0.338 hectares of vegetation within the Wellington District Dam Catchment the Shire proposes to rehabilitate a degraded area of approximately one hectare within Bowelling McAlinden Road reserve. This road reserve is also located within Zone A of the catchment.

- Methodology** References:
- DoW (2014)
- GIS Databases:
- CAWSA Part IIA Clearing Control Catchments
 - Groundwater Salinity, Statewide
 - Hydrography, linear
 - Hydrography, linear (hierarchy)
 - RIWI Act, Surface Water Areas, Irrigation Districts
 - Topographic Contours, Statewide

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

- Comments** **Proposal is not likely to be at variance to this Principle**
- Several non-perennial watercourses intersect or are in close proximity to Bowelling Duranillin Road and Howie Road application areas. In addition, portions of Bowelling Duranillin Road and Capercup Road application areas are located within areas of low relief and subject to flooding.
- The proposed clearing may result in an increase in waterlogging as a result of the loss of vegetation, particularly within areas of low relief. However, given the small size (0.5 hectares) of the application areas which are distributed over a number of narrow, linear road reserves, it is not likely that the proposed clearing would have an impact on peak flood height or duration.
- Therefore the proposed clearing is not likely to be at variance to this principle.

- Methodology** GIS Databases:
- Hydrography, linear
 - Hydrography, linear (hierarchy)
 - Topographic Contours, Statewide

Planning instrument, Native Title, Previous EPA decision or other matter.

- Comments**
- The Bowelling Duranillin Road reserve and Bowelling Duranillin Road - Gibbs Road intersection application areas is located within the Country Areas Water Supply Act 1947 (CAWS Act) gazetted Wellington Dam Catchment Area. The application area is located within an unassigned priority Public Drinking Water Source Area and no priority source protection area is proposed. The Wellington Dam Catchment has however been subject to CAWS Act native vegetation clearing controls since November 1976 to prevent salinisation of water resources (DoW, 2014).

The Department of Water (DoW) has advised that the Bowelling Duranillin Road reserve application area is located within Zone A of the Wellington Dam Catchment, a very high salinity risk part of the catchment. Within high salinity risk areas, the Department of Water's Policy and Guidelines for the 'Granting of Licences to Clear Indigenous Vegetation' provide for the grant of a licence to clear for government works, subject to an equivalent area being reforested within the same or higher salinity risk area, and the Department's records do not show any licence or compensation history for the Bowelling Road application areas (DoW, 2014).

DoW (2014) advise that given the small size of the proposed Bowelling Duranillin clearing (0.338 hectares), the amalgamation of similar offset area requirements over time to create sustainable revegetation areas is acceptable.

To mitigate the impacts of clearing 0.338 hectares of vegetation within the Wellington District Dam Catchment the Shire proposes to rehabilitate a degraded area of approximately one hectare within Bowelling McAlinden Road reserve. This road reserve is also located within Zone A of the catchment.

No public submissions have been received for the application.

No Aboriginal Sites of Significance recorded within the application areas.

- Methodology** **References:**
- DoW (2014)
- GIS Databases:**
- Aboriginal Sites of Significance
 - CAWSA Part IIA Clearing Control Catchments
 - Groundwater Salinity, Statewide
 - RIWI Act, Surface Water Areas, Irrigation Districts

4. References

- Brown A., Thomson-Dans C. and Marchant N.(1998). Western Australia's Threatened Flora, Department of Conservation and Land Management, Western Australia.
- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- DEC (2007-) NatureMaps: Mapping Western Australia's Biodiversity. Department of Environment and Conservation. URL: <http://naturemap.dec.wa.gov.au/>. Accessed 17/01/2014.
- DoW (2014) Advice for Clearing Permit CPS 5913/1. Department of Water, Land and Clearing (CAWSA) Management.Western Australia. (DER ref. A716860).
- Government of Western Australia (2013) 2012 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of October 2012. WA Department of Environment and Conservation, 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.
- Mattiske, E.M. and Havel, J.J. (1998) Vegetation Complexes of the South-west Forest Region of Western Australia. Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment 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.
- Parks and Wildlife (2014) Comments received in relation to Clearing Permit Application CPS 5913/1 - Shire of West Arthur. Department of Parks and Wildlife, Western Australia (DER ref. A716395).
- Roadside Conservation Committee (2014) Environmental Assessment Advice (DER ref. A716373).
- Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.
- Shire of West Arthur (2013) Supporting documentation for clearing application CPS 5913/1 (DER refs. A700537, A700541).
- Shire of West Arthur (2014) Supporting documentation for clearing application CPS 5913/1 (DER refs. A720309, A720312).
- Western Australian Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/> (Accessed 17/01/2014).